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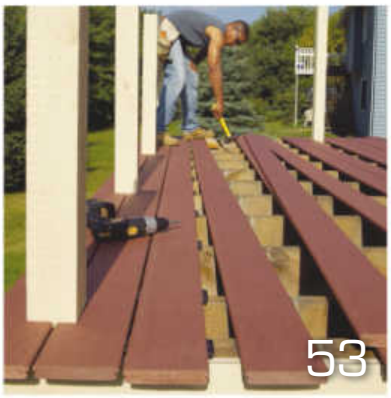
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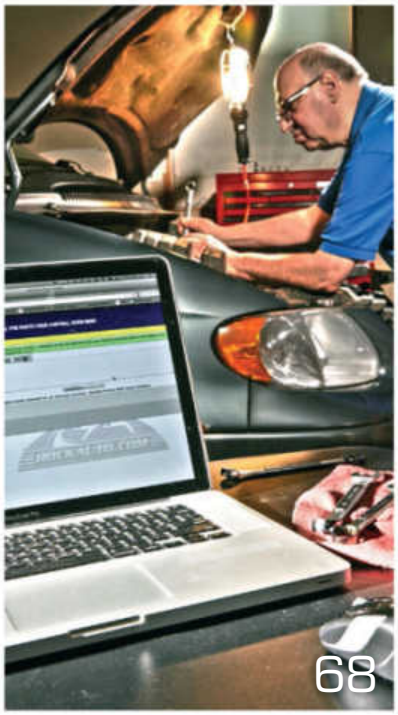

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STUFF we love

BY MARK PETERSEN editors@thefamilyhandyman.com

CLOPAY

ART DIRECTION **ELLEN THOMSON** • PHOTOGRAPHY BY TOM FENENGA UNLESS NOTED

ADD CURB APPEAL WITH A NEW GARAGE DOOR

A new garage door may be the quickest way to give the exterior of your house a face-lift. Often the largest and most prominent feature of a home, a garage door that's tailor-made can make a highly visible improvement. And Clopay makes choosing the right door a breeze with its Door Imagination System, which lets you upload a photo of your house and plug in any door style, hardware option and window configuration you can dream up. The door styles range from old-fashioned carriage house doors to modern translucent ones like the door shown here.

Clopay makes doors with real and faux wood, steel and composite, and in a variety of colors and stains and finishes. If good looks aren't enough of an excuse for a new door, energy efficiency may be. Certain insulated Clopay models provide an R-value of 20. As you might guess, the prices of these doors vary considerably. A single-stall stamped metal door can run as little as $350, or you could pay more than $10,000 for a door with fancy features. The Home Depot carries some standard models, or you can place a special order.

One tough marker

As a siding contractor, I carried a permanent marker in my pouch at all times. I used it to mark stud locations, keep track of measurements and scribe the cutting lines on the siding. I bought them by the dozen because it only took a week or so for the tips to wear out. Now Sharpie makes a marker for pros that lasts 50 percent longer than before on abrasive surfaces. It also works better on wet and oily surfaces. Get the Sharpie Professional for $2 at The Home Depot.

Mark Petersen, Associate Editor

THE FAMILY Handyman

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EDITORIAL OFFICE
The Family Handyman, 2915 Commers Drive, Suite 700
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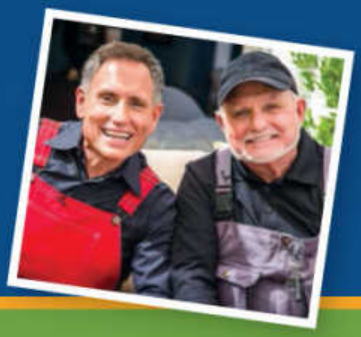
On the House

With the Carey Brothers
Tips of the Month



NEW MINI SCAFFOLDING MAKES JOBS EASIER, SAFER

If you're working on a project that's out of reach, consider the new generation of mini portable rolling scaffolding. During our recent visit to the National Hardware Show, we had the opportunity to visit the Metaltech exhibit for a look at the latest and greatest in scaffolding of all shapes and sizes.

Although the traditional heavy duty tower scaffolding is still the category stalwart, new smaller models such as Metaltech's Jobsite Series – consisting of 4', 5' and 6' models – offer tremendous versatility that can make virtually any project safer and easier – even when working with your feet on the ground.

In contrast to a step ladder, spacious platforms allow for a wider work area. One is less likely to overreach and there are fewer trips up and down steps, making a safer work environment and less overall fatigue. They can be used for everything from a portable, multi-level adjustable workbench to a rolling cart that can transport large, heavy loads with ease – thanks to the heavy duty double lock casters. The mini units fold flat for compact transport and storage and weigh as little as 50 lbs. – platform and all!

Depending upon the model, accessories can include safety rails, a folding tool tray, and multiple adjustable platforms. The largest model, is great for working on staircases and has double prong locks for easy adjustment. The Jobsite Series range in price from $99 to $199 and can be found at Lowes, Lowes.com, Northern Tool, NorthernTool.com, Do-it-Best, Ace, select Home Depot stores, and HomeDepot.com.

HELP FOR GRANITE, STONE AND QUARTZ

Granite, stone and quartz have become increasingly popular finishes for all areas of the home. Durable as they may be, they are still vulnerable to staining, wear and can become dull over time. The secret: regular cleaning, polishing and sealing. Some cleaning products can produce unfavorable results or damage the finish and we are especially wary of products that claim to "do it all." Instead, we have Granite Gold, a system of compatible products that work in harmony offering great longterm protection. The product line consists of a variety of products that will keep your precious finishes well protected and looking good for years to come. Granite Gold is available in grocery, hardware, mass merchant and specialty stores.

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Visit their website at **OnTheHouse.com** for recaps of the show & other helpful info.

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DIY WORK WEAR

SLIP-IN KNEE PADS

I've always loved that the knees on my Carhartt bib overalls were reinforced with a second layer of fabric, but I could never figure out why there was an opening at the bottom. Turns out there are two good reasons for it. One, when the top layer of fabric gets a hole in it, debris collects inside, and the opening lets you clean it out. And two, you can slide knee pads, like these Soft Knees from Working Concepts Inc., into that space. Now, as long as I'm wearing my bibs, I don't have to mess with my uncomfortable strap-on knee pads. The foam pads are easy to install, and if you don't wash your overalls in hot water, you don't have to remove the pads until it's time for a new pair of bibs. Soft Knees knee pads are available online for $17, or you can find a retailer near you at softknees.com.

Mark Petersen, Associate Editor

POST SHIELD

Post protector

Lawn mowers and string trimmers can really beat up the bottom of wooden fence and mailbox posts. And that exposed bare wood can deteriorate faster and attract hungry insects. Now you can protect your 4x4 posts (3-1/2 x 3-1/2 in. actual size) with Post Shield rugged plastic sleeves. If your posts have already taken a beating, you can use the sleeves to cover the damage. The four pieces are easy to install and are available in black, white and bronze. A 4-in.-tall sleeve costs about $8; a package of six, $36. Check them out at postshields.com.

ALL-IN-ONE YARD EQUIPMENT

Got lawn? A lawn mower is mandatory. Does it snow where you live? Running a snow thrower is a heck of a lot easier than shoveling. Hate raking leaves? A 1,000-cfm leaf blower will clear a yard in a jiffy. But if you don't want to maintain all those gas engines, check out the new FLEX system from Troy-Bilt. FLEX features one power unit that runs several attachments. This system can save you a little money depending on the attachments you buy, but it will definitely save space in your garage, and it will absolutely save you the hassle of maintaining and storing several different gas engines. The power unit costs $399, and the attachments range from $279 to $499. The Troy-Bilt FLEX is available at Lowe's.

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A WRENCH FOR HARD-TO-REACH SPOTS

There have been several variations and improvements on the old adjustable wrench, but none of them seem to solve the two problems we encounter most: jaw capacity that's too small and jaws that are too thick. That's why I'm impressed with Channellock's new Xtra Slim Jaw WideAzz adjustable wrenches.

The jaws are 40 percent thinner than on conventional adjustable wrenches. That makes them perfect for plumbing jobs where you need a thin wrench to hold the body of a compression or flare fitting while you tighten the nut with a second wrench. Also, these wrenches have an extra-large jaw capacity that works great for most household, automotive, small engine and yard equipment repairs. Expect to pay about $32 for the 6-in. (6SWCB) and $38 for the 8-in. (8SWCB) at an online retailer.

Rick Muscoplat, Contributing Editor

A paintbrush's best friend

I always keep a jug of Citristrip with my painting supplies. This citrus-based paint stripper works well for stripping furniture, but I use it regularly to clean paint and varnish from my good brushes. After a quick soak in Citristrip, the dry paint and varnish loosen up and wash right out. If you like high-quality brushes as much as I do, you'll like knowing it helps keep them going a long time. A quart will run you $12 at home centers and hardware stores. A nice bonus: It smells great!

Ken Collier, Editor in Chief

MARK E INDUSTRIES

EASY-TO-INSTALL SHOWER SEAT

A shower seat is a key component for making a bathroom safer for older adults. The one shown here, the Goof Proof Shower Seat by Mark E Industries, can be installed before the tile is installed or retrofitted over the existing tile. The molded plastic seat has built-in level vials to achieve the perfect slope for water drainage, and the kit comes with all the screws, shims and anchors you'll need to finish the job. The seat is 30 in. wide but can be trimmed to 24 in., and it has a capacity of 400 lbs. It's available for $63 at home centers.

A superior air hose

I've been using a Flexzilla air hose for about five years now as I build our summer home. It's seen me through framing, sheathing, roofing, siding and trim. This hose is as good as it gets: It lies flat with absolutely no coil memory. It's soft and doesn't mar woodwork but is tough enough to use on the roof. It coils easily, and the bright color makes it easy to spot, so you're less likely to trip or run over it. It's one of those rare accessories that I would instantly replace if I ever lost it. The 50-ft., 3/8-in.-diameter version costs about $35 at home centers and online.

Ken Collier, Editor in Chief

Button up that garage door

I heat my garage shop full time, and when I'm outside on dark winter nights, I can see a lot of light between the weather stripping and the overhead door. Light = lost heat = untold dollars' worth of BTUs pouring outside. The problem is that there's so much space between the rollers and the track that the door doesn't stay tight against the weather stripping.

I just invested in the Green Hinge System to solve the problem. The design is simple but brilliant. Each replacement Green Hinge has a built-in spring that pushes the door against the weather stripping for a much better seal. The hinges also quiet the door because the rollers don't rattle around in the track. It's a well-made product and I fully expect it to cut my heating costs this winter.

A set of six hinges costs about $85. Go to greenhingeofamerica.com to look them over and choose the right ones for your door size.

Travis Larson, Senior Editor

Handy HINTS®

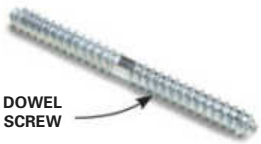
FROM OUR READERS handyhints@thefamilyhandyman.com

EDITOR DAVID RADTKE • ART DIRECTION MARCIA ROEPKE • PHOTOGRAPHY TOM FENENGA

CUT SMALL PARTS SAFELY

Recently I needed to cut some small furniture legs on my miter saw. With their irregular shape, they were impossible to hold safely, so I attached each leg to a scrap 2x2 with a dowel screw. These assemblies stayed straight and kept my hands far from the blade.

David Alexander



Slide-proof ramps

If your vehicle ramps slide forward as you drive onto them, secure them to a piece of plywood. I used 3/4-in. plywood, some 2x4 blocks, lag screws and bolts. Now as I drive onto the plywood, the weight of the car holds the ramps in place so they don't skid away on contact. Drill a hole in the plywood so you can hang the ramps on the wall.

Wayne Clark

No slipping, no splinters

To prevent friction burns and splinters while sanding a curved tabletop, I put on a leather glove and wrapped painter's tape around it, sticky side out. The tape kept the sandpaper from slipping, and the glove protected my hand.

Eliot Sennett

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JUST THE RIGHT HEIGHT

When I had to position, adjust and fasten a heavy medicine cabinet by myself, I came up with this solution. All it took was a stack of wood scraps!

John Engeriser

Renew old epoxy

Awhile back, I reached for my two containers of epoxy and noticed that the resin in one container had crystallized exactly like honey that's been in the cupboard too long. The solution is exactly the same too: Set the container in a bowl of hot tap water. After about 15 minutes, I emptied the container and refilled it with hot water. After about a half hour, the epoxy regained its normal consistency. Good as new!

Ken Holte

Nonslip sandpaper

Whenever I use sandpaper sheets that are folded in half, the sandpaper slides on itself as I sand. To solve the problem, I just spray a light coat of contact adhesive on the back of the sheet. Once it has air-dried for a couple minutes, I fold the sheet in half for a permanent bond. Works like a charm.

Brian Flynn

Homemade air cleaner

Here's my inexpensive alternative to factory-made air cleaners: After measuring my window fan, I went to the home center and found the perfect size filter to fit the fan (less than $5). I taped it to the "draw" side of the fan and paid attention to the filtration direction printed on the filter. I turned on the fan and found that it worked great. Now I can get the air clean enough to do my finish work in the shop.

Thomas Wnorowski

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ONE-DAY STORAGE

An incredibly easy solution for a cluttered garage

by David Radtke
editors@thefamilyhandyman.com

This storage system is made mostly from wire shelving and plastic-coated particleboard (called "melamine"). Those two simple materials, along with some clever engineering, provide three big benefits:

Quick, simple construction. If you can make a few easy cuts (which don't have to be perfect), drive some screws and brush on a little paint, you can build this system in a weekend. If you're an experienced DIYer, you might even be done in a day.

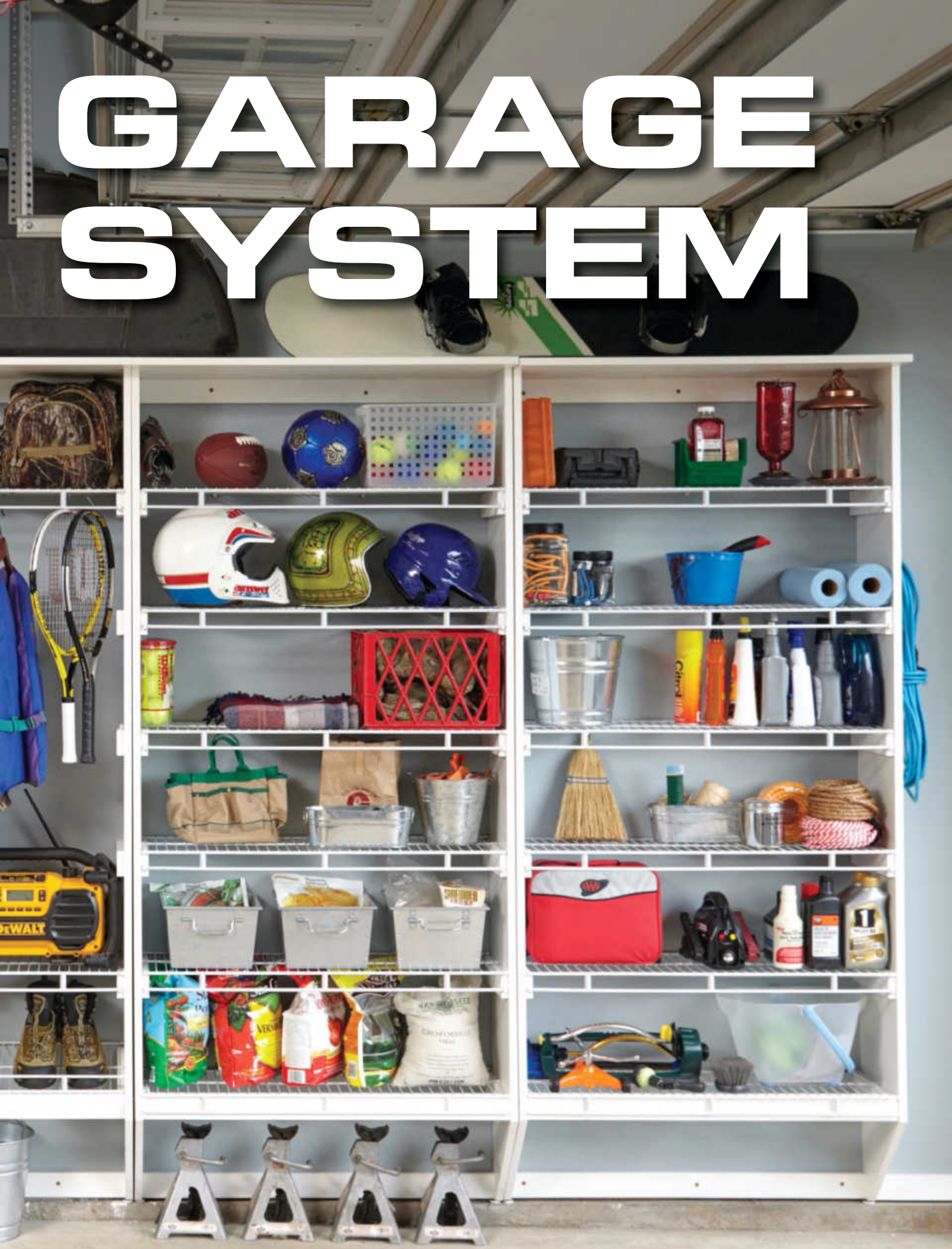
Fits any space. The system is made up of separate units, so you can build just one, cover an entire wall with several units or leave spaces between units.

Versatile storage. Aside from wire shelves, the system includes optional hanging spaces for clothes and outdoor gear, plus oversize upper shelves for bulky stuff. As your needs change, you can easily remove or reconfigure the shelves.

WHAT IT TAKES

TIME: 1 or 2 days
COST: $100 per unit
SKILL LEVEL: Beginner
TOOLS: Circular saw or jigsaw, drill, clamp, level, stud finder, bolt cutter

GARAGE SYSTEM



1 CUT THE SIDES
Cut one melamine board at a 45-degree angle and use it as a pattern to mark the others for cutting. Mark your cutting line on a strip of painter's tape—the tape reduces chipping as you cut.

2 POSITION THE SHELF SUPPORTS
Mark where the edge of each shelf support is located and mark a centerline for screw locations. Drill three 9/64-in. screw holes for each support.

3 FASTEN THE SHELF SUPPORTS
Drive 1-1/4-in. screws through the sides and into the shelf supports. A clamp makes this step much easier.

4 ASSEMBLE THE UNIT
Drill holes in the top, then drive cabinet screws to fasten the top to the sides.

Build the units

To get started, cut all the parts (see Cutting List, p. 23). The coating on melamine tends to chip when you cut it. For cleaner cuts, use a 60-tooth carbide circular saw blade and apply painter's tape over the cut (**Photo 1**). Melamine is slippery stuff, so clamp it in place before cutting. Set the depth of your saw blade at 1 in. Chipping won't be a problem when you cut the solid wood parts (B and D). When you cut the supports for the lowest shelves (B1), note that they're shorter than the others. To avoid slow, fussy painting later, paint the wood parts before assembly.

Our shelf spacing is 12 in., but any spacing you choose is fine. Lay pairs of sides (A) next to each other when you mark shelf support locations. That way, you can be sure that the supports will match up after assembly. Drill screw holes (**Photo 2**) and then fasten the shelf supports (**Photo 3**).

Pick out a flat spot on the floor and attach the top (C) to the sides (**Photo 4**). Then tilt the assembly up a few inches and slide wood scraps beneath it so you can add the rails (D) with 2-in. screws (**Photo 5**).

With the unit completely assembled, sand the exposed cut edges of the melamine using 150-grit sandpaper, then paint them (**Photo 6**). Finally, hammer on some furniture glides (**Photo 7**) and the unit is ready for installation.

ART DIRECTION **VERN JOHNSON** • PHOTOGRAPHY **TOM FENENGA** • ILLUSTRATION **DAVID RADTKE**

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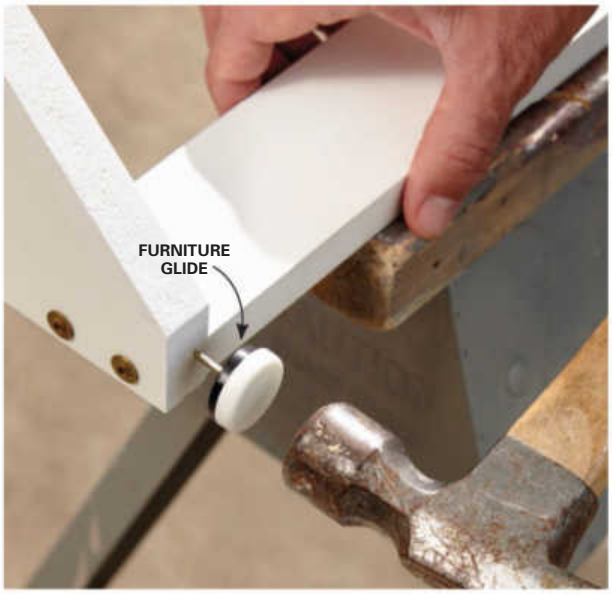
5 INSTALL THE RAILS
Drill screw holes in the sides and fasten the three rails. You'll need to raise the unit off the floor in order to screw the top and bottom rails.

6 PAINT THE CUT EDGES
For looks and moisture protection, apply two coats of paint. If you slop a little paint onto the melamine surface, just wipe it off with a damp rag.



7 ADD GLIDES
Nail plastic furniture glides to the bottom of the sides to keep them from resting directly on damp surfaces, especially concrete.

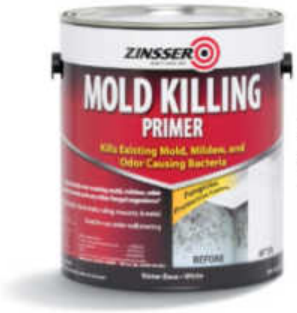
Install the units

If you have finished walls, locate the wall studs with a stud finder and mark them with masking tape. Get some help to lift the assembly up to the wall and hold it in place (**Photo 8**). Our floor had a row of concrete blocks that protruded from the wall about 1-1/2 in., so we rested the glides on them. The blocks were level but the floor had a slight pitch toward the door, so this saved us the hassle of having to allow for the slope of the floor.

With the assembly against the wall, you can shim underneath to level it (if necessary) and then plumb the sides with a level. Screw it to the wall studs with 2-1/2-in. screws (**Photo 9**).

8 INSTALL THE FIRST UNIT
Mark the stud locations with painter's tape and set the first unit in place. To ensure that the unit is level and square, check both the top and one side with a level.

This primer is killer.



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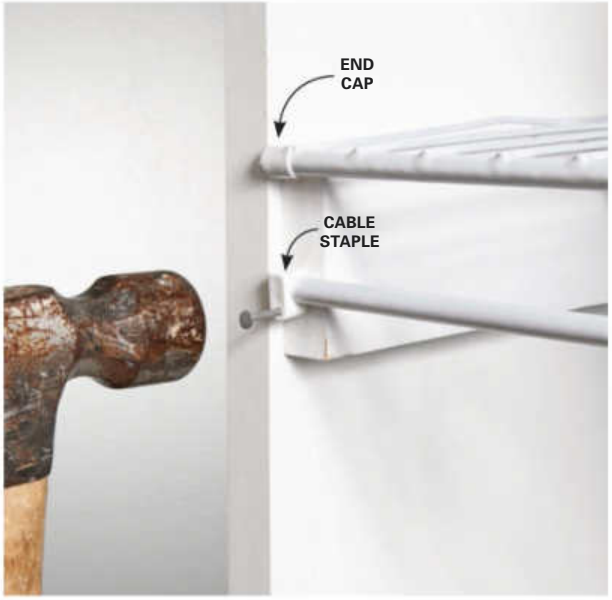
9 ADD AS MANY UNITS AS YOU LIKE
With the first unit installed square and level, you can simply butt the next unit against it. Screw all units to studs at the top and bottom rungs.

If you're willing to spend $25 or so on a bolt cutter, cutting the wire shelves will be quick and easy (**Photo 10**). Bolt cutters are sized by length; 24 in. is a good choice. When the shelves are cut, set them in place and "clip" them to the wall (**Photo 11**). Also secure the shelf fronts with coaxial cable staples (**Photo 12**), which are available in the electrical aisle at home centers. Remove the nails that come with the staples and use 4d nails instead. To store balls or other items that tend to roll off shelves, install a shelf or two upside-down. The lip on the front of the shelf keeps stuff in place.

10 CUT THE SHELVES
A bolt cutter is the best tool for cutting wire shelving to length. A hacksaw or a metal-cutting blade in a jigsaw will also do the job.

11 ANCHOR THE SHELVES
Fasten each shelf to the wall with at least two clips. When you want to fasten the clip to a stud, simply cut off the drywall anchor part of the clip and drive a screw through the clip.



12 FASTEN THE SHELF FRONTS
Lock the shelves in place with coaxial cable staples. End caps give the shelves a finished look.

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Figure A
Shelf unit

Overall dimensions: 11-3/4" deep x 37-1/2" wide x 85-1/2" tall (top shelf is 15-3/4" deep)

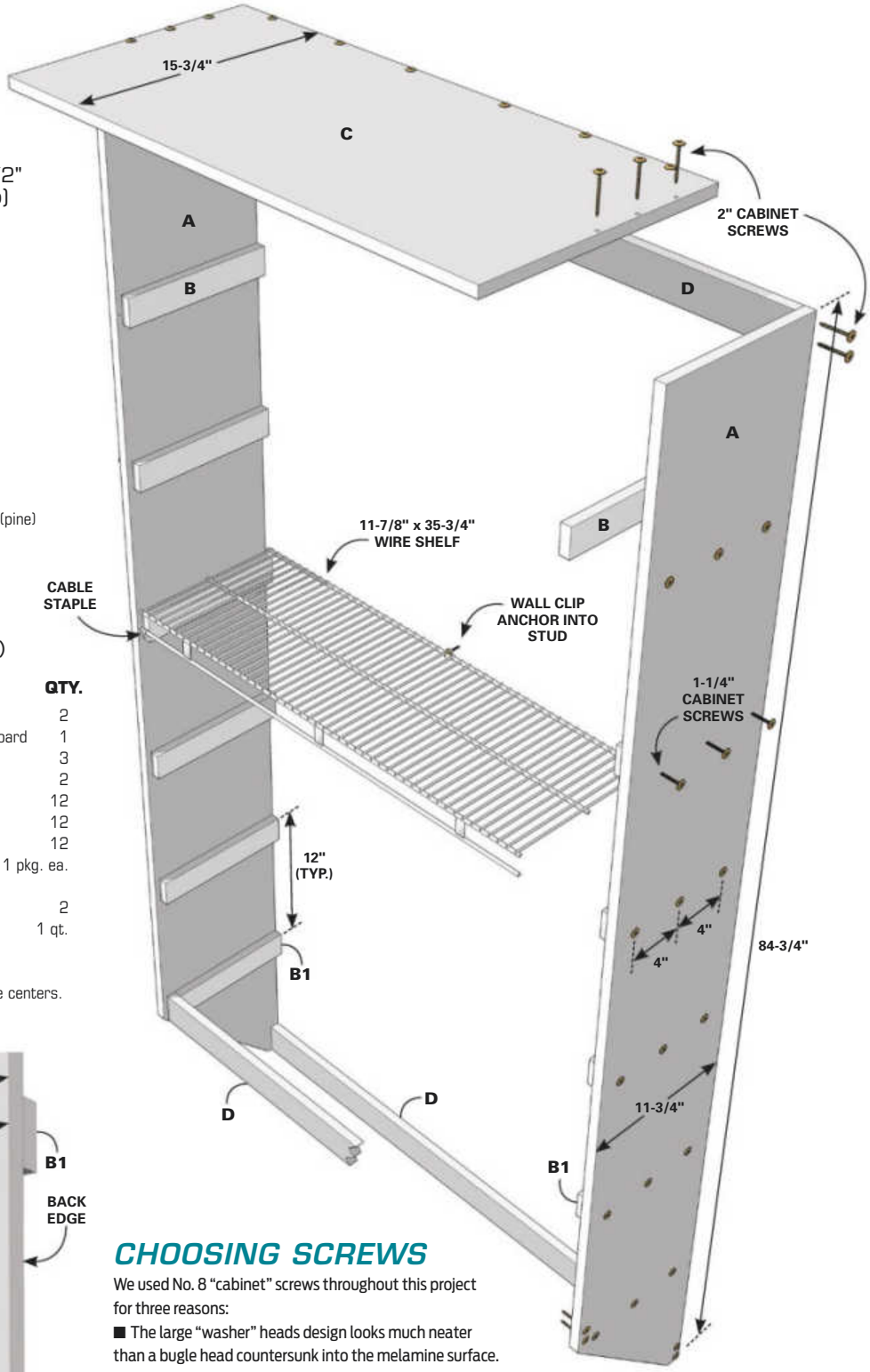
Cutting List (for one unit)

KEY	QTY.	DESCRIPTION
A	2	3/4" x 11-3/4" x 84-3/4" sides (melamine)
B	10	3/4" x 2-1/2" x 11-1/2" shelf supports (pine)
B1	2	3/4" x 2-1/2" x 10-3/4" shelf supports (pine)
C	1	3/4" x 15-3/4" x 37-1/2" top shelf (melamine)
D	3	3/4" x 2-1/2" x 36" rails (pine)

Materials List (for one unit)

ITEM	QTY.
3/4" x 11-3/4" x 8' melamine shelf board	2
3/4" x 15-3/4" x 37-1/2" melamine shelf board	1
3/4" x 2-1/2" x 8' pine boards	3
12" x 12' wire shelving	2
Wire shelving wall clips	12
Wire shelving end caps	12
Coaxial cable staples	12
Cabinet screws (1-1/4", 2", 2-1/2"), 4d (1-1/2") nails	1 pkg. ea.
Furniture glides	2
White paint	1 qt.
150-grit sandpaper	

All of these materials are available at home centers.



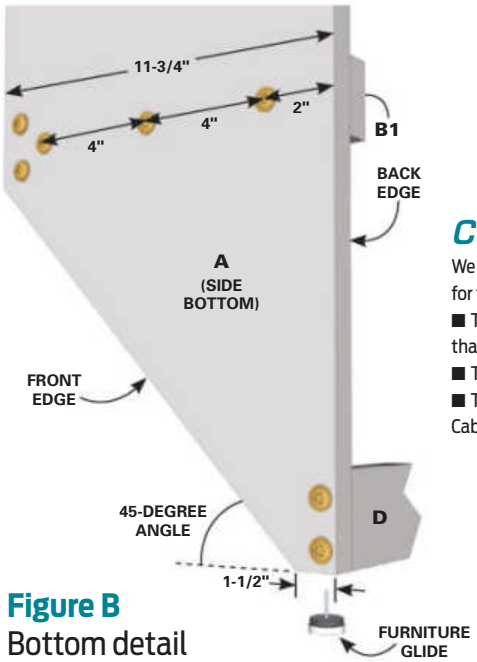


Figure B
Bottom detail

CHOOSING SCREWS

We used No. 8 "cabinet" screws throughout this project for three reasons:

- The large "washer" heads design looks much neater than a bugle head countersunk into the melamine surface.
- The washer heads won't pull through the particleboard.
- The coarse threads hold well in particleboard.

Cabinet screws are made by GRK, Spax and other manufacturers.

MEET THE BUILDER

David Radtke is a designer, illustrator, remodeler and cabinetmaker in Minneapolis. He specializes in unique solutions for inside and outside the home.

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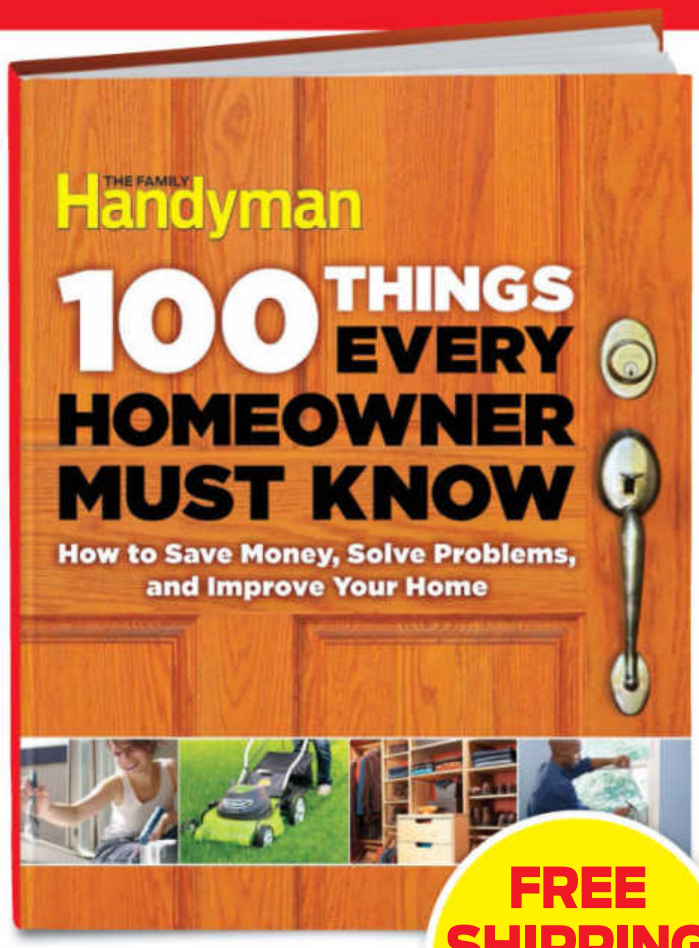

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PEGBOARD PALOOZA

Ordinary material—extraordinary possibilities

by Spike Carlsen
editors@thefamilyhandyman.com

A funny thing happened when I began thinking about writing this article: I started noticing pegboard *everywhere*—panels, hooks, doodads, you name it. Every hand tool in the hardware store was hanging on pegboard. Every bag of bolts, roll of duct tape and tin of Tic Tacs at the checkout counter—pegboarded. Even the pegboard hooks were hanging on pegboard hooks.

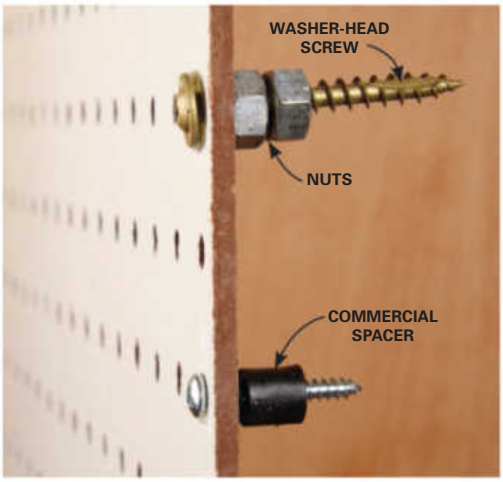
But I guess that should come as no surprise. Retailers want a display system that's sturdy, easy to rearrange and adaptable—the same qualities we need in our work spaces at home.

ART DIRECTION **MARCIA ROEPKE** • PHOTOGRAPHY **GARY SUNDERMEYER**

PEGBOARD SPECS

All pegboard has holes with 1-in. spacing, but there are two thicknesses and two hole sizes available.

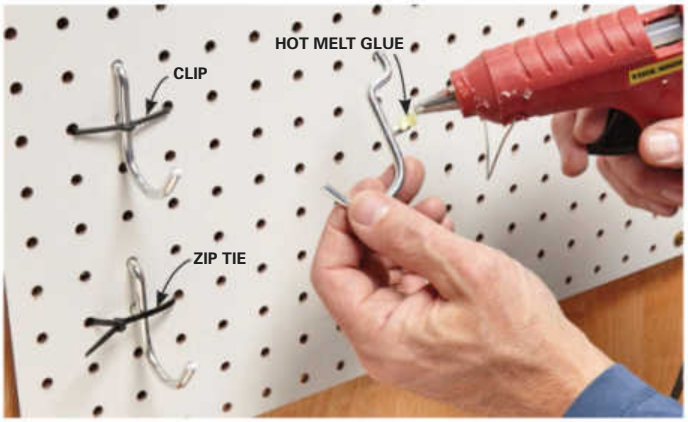
- **"Small hole" pegboard is usually 1/8-in.-thick hardboard with 3/16-in.-diameter holes. The holes will accommodate only the smaller 1/8-in. pegs. This thickness is good for small projects (like our cabinet door panel) and for hanging lighter weight stuff. But for heavy tools—and longevity—go with the thicker board. Cost for 1/8-in.: about 30¢ per sq. ft.**
- **"Large hole" pegboard is usually 1/4-in.-thick hardboard with 1/4-in.-diameter holes that will accept both 1/8-in. and 1/4-in. hooks. This is the type you need for workshops, garages and other heavy-use areas. Some come with a melamine coating on one side. Cost for 1/4-in.: about 50¢ per sq. ft.**



Hefty standoffs

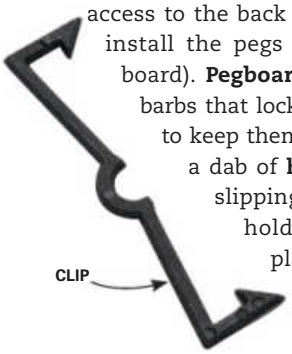
Pegboard needs about 1/2 in. of "standoff" space behind it so the hooks can be inserted. Plastic and metal pegboard panels have this space built in, created by the L-shape flanges at the edges. But you can also create this standoff space in several ways:

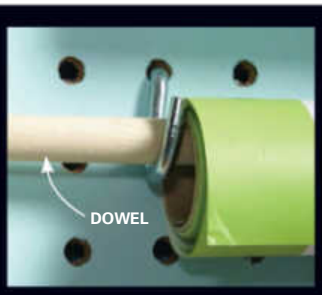
- Install **screw-in standoffs with spacers** (**see photo**). The store-bought versions often have short screws with small heads and wimpy plastic spacers. Make your own using beefier washer-head screws and nuts for spacers. On larger panels, install standoffs in the center to maintain space and add support. **Tip**: Use hot-melt glue to hold these mid-panel spacers in place before you install the pegboard.
- **Create a frame** for the back of the panel using 1x2s or 1x3s (**see photo**, p. 33). For panels wider than 3 ft., add a 1x2 rib to the back every 2 ft. to support the weight of the tools and take the flex out of the panel.

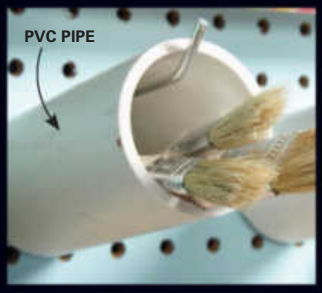


LOCK 'EM IN

The No. 1 complaint about pegboard? Hooks falling out when you remove a tool. The solution? Lock 'em in place. **Zip ties** are an inexpensive, sure-shooting way to go—but you need to have access to the back of your pegboard (or plan ahead and install the pegs and zip ties before you mount the board). **Pegboard clips** (about 20¢ each) have small barbs that lock into holes on both sides of the hook to keep them in place. Another approach is to add a dab of **hot-melt glue** to the lower leg before slipping the peg into the hole. The glue will hold well enough to keep the hook in place, but it will be removable later with a light tug.







Make hooks hold more

Some items won't hang directly on pegboard hooks. But with a little ingenuity, you can make hooks hold just about anything. Here are three ideas:

Hooks and 1/2-in. wood dowels organize wrapping paper—no more digging through a stack of unraveling rolls.

Binder clips grab items that can't hang on hooks. The clip shown here, for example, holds a canvas tool pouch.

A section of PVC pipe slipped over a long hook is a great nook for skinny stuff: pencils, brushes, zip ties....

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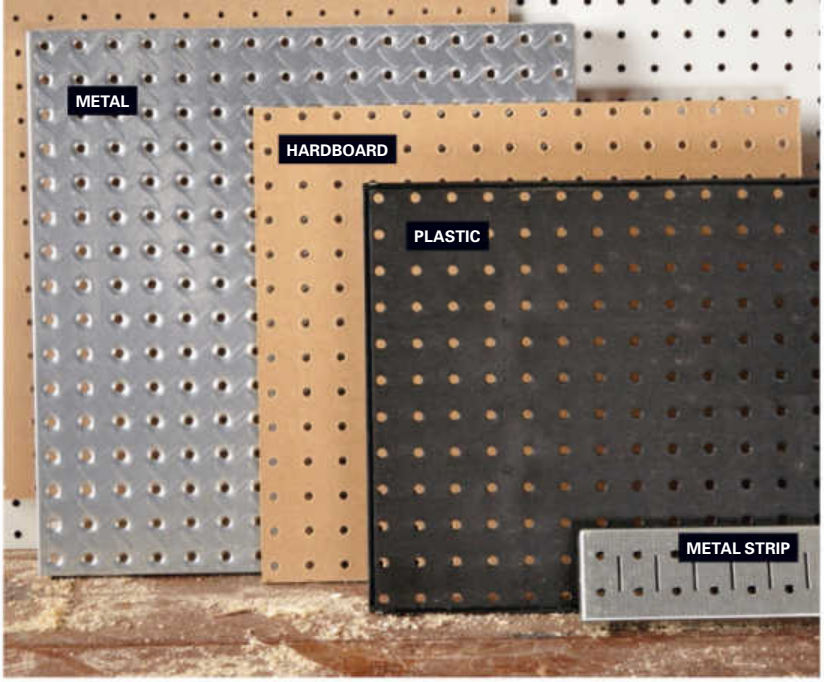


BEYOND HARDBOARD

Most home centers carry only hardboard pegboard, but you'll find other materials by searching online for "metal pegboard" or "plastic pegboard."

■ Metal pegboard has 1/4-in. holes and L-shape edge flanges that create built-in standoffs. The panel sizes are normally in 16-in. and 24-in. increments. Metal pegboard has a cool industrial look and is darn near indestructible. Cost: $5 to $7 per sq. ft.

■ Metal pegboard strips are ideal for situations where you need a single, sturdy strip of pegboard—like in the garage for hanging long-handled tools. The strips have 1/4-in. holes and built-in edge flanges for standoffs, and they're outrageously sturdy. Cost: $3 to $4 per lin. ft.

■ Plastic pegboard has 1/4-in. holes, folded edges to create standoffs and center ribs for rigidity. Many systems come with slide-in connectors for joining panels. It's at least as sturdy as hardboard pegboard. Cost: $4 to $5 per sq. ft.

GO HOOKLESS

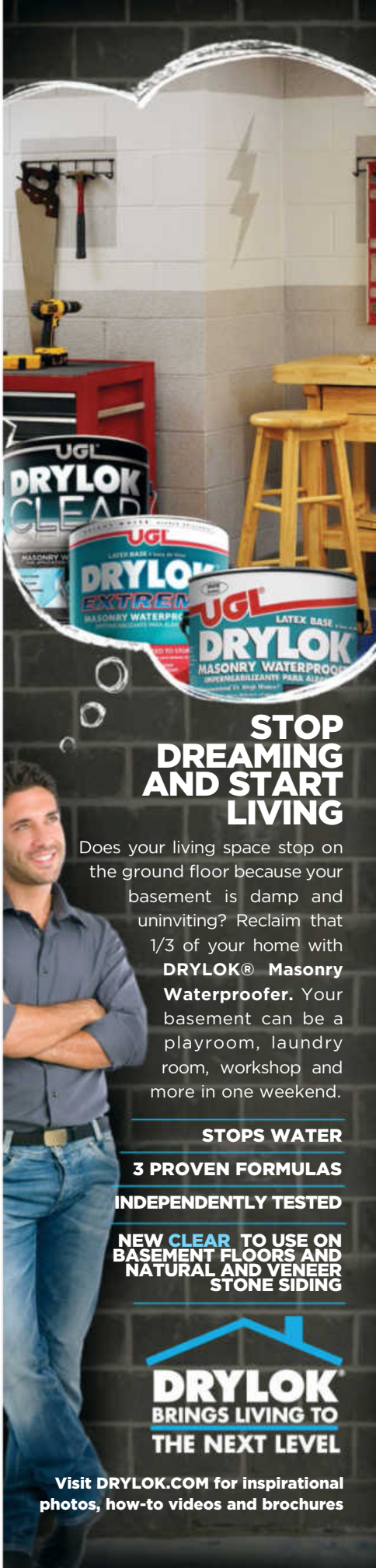
You can craft your own hooks using stuff from the hardware aisle. Clip the tips from No. 6 hollow wall anchors, drive them into 1/4-in. pegboard holes, then secure your custom tool holder by driving screws into the anchors. Short 5/16-in.-diameter lag bolts fit snugly into 1/4-in. holes to create inexpensive hangers for lightweight objects.

Hooks are available in two sizes

Pegs and hooks come in two thicknesses: 1/8 in. (which will fit in any pegboard) and 1/4 in. (which fits only "large hole" pegboard). Both can bear the weight of any hand tool, but since the cost difference is negligible, go with the 1/4-in. hooks because they're less likely to pop out of the holes. The one drawback to the 1/4-in. size is that they're difficult to bend and modify for custom uses.

HANG ANYTHING

Most hardware stores and home centers carry standard hooks for basic hand tools, but specialized hangers are available too. The circular saw shelf ($15), cordless drill holder ($5), wire basket ($5), bins ($1 each) and other doodads can help organize hard-to-hang tools. Search online for "pegboard" followed by the type of hanger you're looking for, such as "pegboard circular saw shelf."



Custom shelving

Standard pegboard hooks can accommodate most tools—but sometimes you need a special place for special stuff.

Drill 1/4-in. holes in the backs of homemade shelves, then use those holes to slide the shelves over L-hooks. Or use cable staples to attach plywood shelves to standard pegboard shelf brackets. The staples allow you to slide the shelf back and forth so you can easily fit the shelf bracket "legs" into the holes.

✓Yes

✓Yes

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✓Yes

✓Yes

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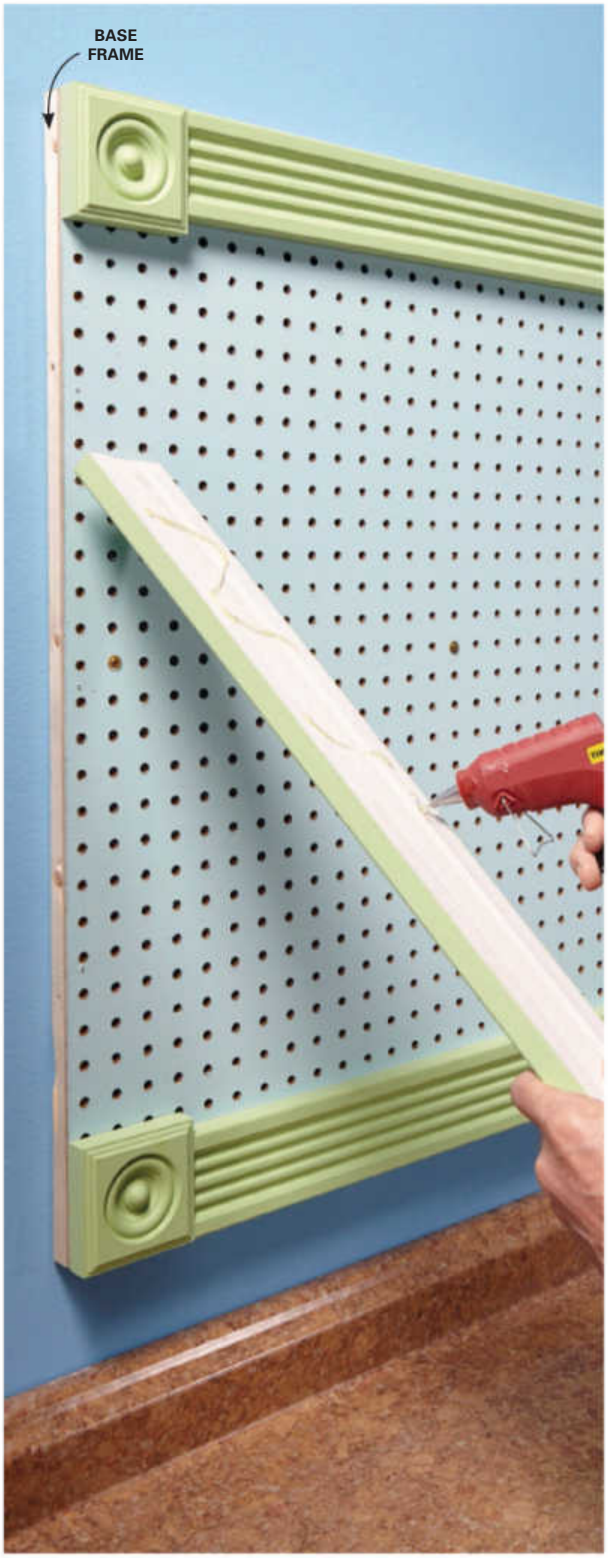

Dress it up

Most pegboard comes in two colors—boring white and boring brown. But it doesn't have to stay that way. Roll on a coat of primer followed by gloss or semigloss paint (glossy paints are easier to wipe clean). Apply light coats so you don't clog the holes. Then snazz it up with a frame. After we attached our pegboard to a 1x3 frame, we added corner blocks and trim with hot-melt glue—no fancy miter cuts or fasteners needed.

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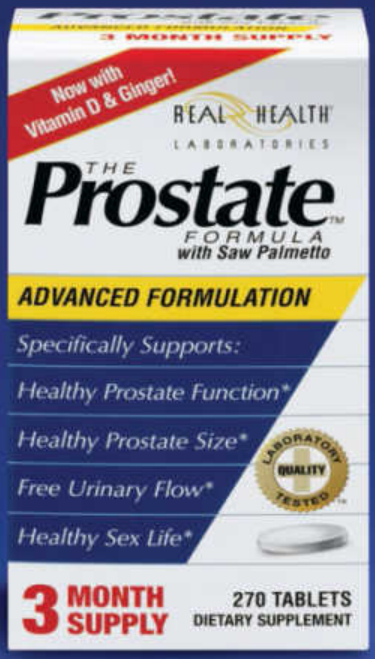

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PEGBOARD WALLS

Create pegboard walls by running 1x3 strips horizontally at the top and bottom of the panel and every 16 in. or 24 in. between. Use 1/4-in. pegboard and attach it to the strips with washer-head screws. The strips will also allow you to mount screw-on hooks to the wall for very heavy items like bikes and wheelbarrows.

Storage behind closed doors

Pegboard is great for organizing kitchens, laundry rooms and bathroom cabinets. Rout a groove in a 1x2 frame using a rabbet bit, attach the pegboard with glue and brads, then mount it to the door. The frame helps support the edges of the pegboard and creates a 1/2-in. space behind the board so pegs can be inserted.

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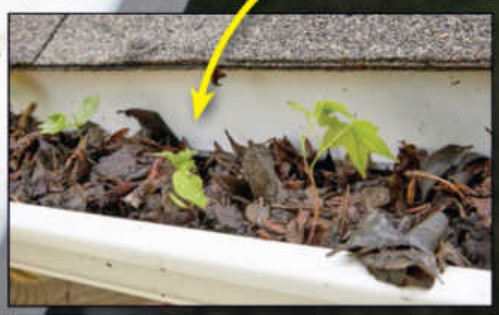
GUTTER GUARDS

Which type will work best for your house?

by Mark Petersen
editors@thefamilyhandyman.com

Cleaning out gutters is a miserable, messy, stinky job. Installing gutter guards could put that headache behind you, but how the heck are you supposed to know which type to buy? In this article, we'll examine the three most popular types of gutter guards: screen, surface tension and fine mesh. We'll compare the different features, installation methods and prices to help you decide which ones will work best for your house. And if you install them yourself, you can save tons of money—some pro installers charge as much as $20 per ft.! The guards we'll cover are designed for 5-in. K-style gutters, typical on many homes.



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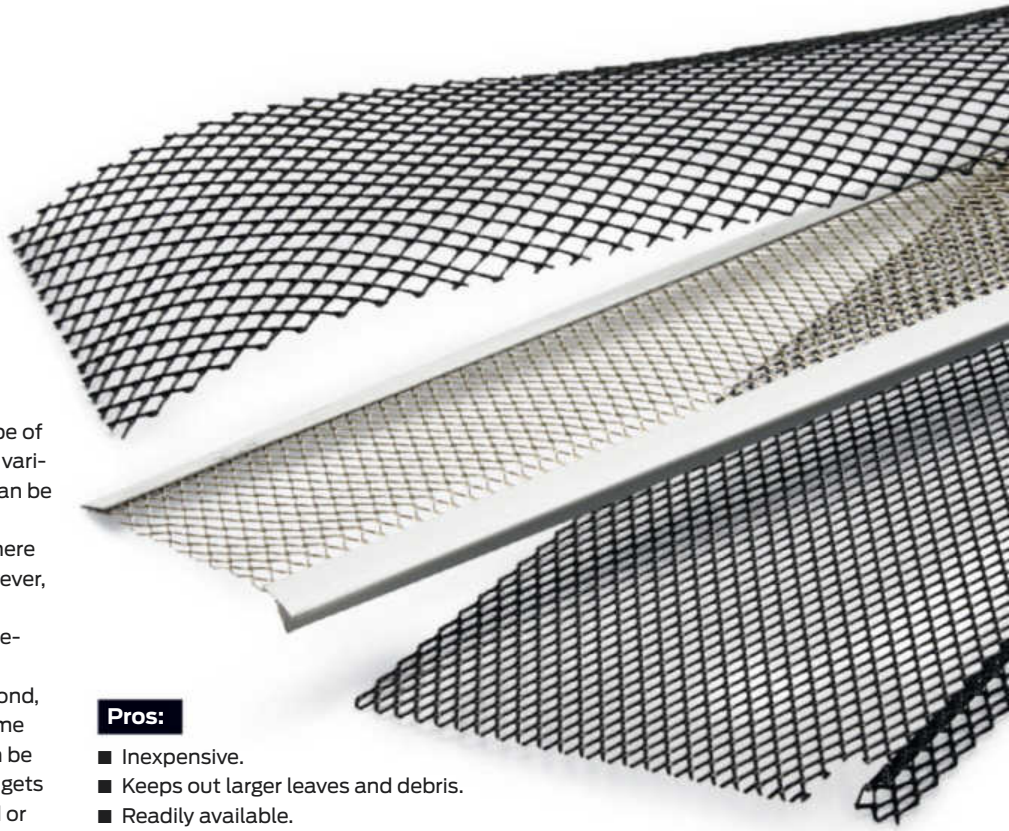
2015 Best in DIY

Screens



10¢ to $2 per foot

Screens are the most common type of gutter guard. They come in a wide variety of shapes and materials and can be installed in a few different ways. Screens work well in situations where leaves are the main problem. However, the openings in screens are large enough to let in seeds and pine needles, and cleaning them out may require removing the screens. Second, the screens themselves can become plugged, and cleaning screens can be tricky because some of the debris gets entangled and isn't easily brushed or blown off. So if you currently find lots of seeds or needles in your gutters, screens may help, but don't expect them to eliminate gutter chores.

Screens are the easiest to install. Some can be slid up under the shingles, which is ideal because the screen will angle downward and allow debris to slide off the roof. Other screens just drop in, which makes them a good choice if you have old, brittle shingles, or a shingle type other than asphalt that can't be pried up.

Pros:

- Inexpensive.
- Keeps out larger leaves and debris.
- Readily available.
- Easy to install.
- Works with various roof types: shingles, steel, slate, wood, tile, etc.
- Can work with old, brittle shingles.

Cons:

- Plastic versions may eventually be damaged by UV sunlight.
- Branches, snow, ice and strong winds can damage high-profile styles that protrude above gutters.
- Can get clogged with seeds and needles.
- Higher-profile versions may cause debris dams.
- Limited color choices.
- Screens and gutters may need occasional maintenance/cleaning.
- Difficult to clean.

SIMPLE TO INSTALL
Plastic drop-in screens like this are super easy to install. Just cut them into sections and wedge them into place between the gutter and the fascia—no fastening necessary.
Frost King Plastic Gutter Guard, 10¢ per foot, available at home centers.

DROP IN AND SCREW DOWN
This screen gets wedged against the fascia and fastened to the outside lip of the gutter with stainless metal screws.
Spectra 3-ft. drop-in screen, 66¢ per foot, available at home centers.

SLIDE UNDER THE SHINGLES
Carefully lift the shingles. Try to install the screen between the shingles and the underlayment or between two layers of shingles. Don't install under the underlayment.
Spectra Armour Lock, $1.40 per foot, available at home centers.

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2015 Best in DIY

Surface tension

$3 to $6 per foot

With surface-tension gutter guards, water clings to the rounded nose of the guard and flows into the gutter, while leaves and other debris fall off over the edge. Surface-tension guards work very well with leaves and other large debris. Small debris sometimes gets in but usually washes out the downspouts without a problem.

This type of guard works only if the guard is installed at an angle that's similar to the slope of the roof. This isn't always possible on long gutter runs because the gutters need to be pitched so the water flows to the downspouts, which means one end will need to be hung high. If you install surface-tension guards on gutters that are mounted high on the fascia, they will cause debris dams and allow more junk inside the gutter.

Surface-tension gutter guards are more visible than other styles, and water can shoot over them in heavy downpours. However, if they're installed correctly, the amount of debris that enters the gutter is usually small enough to be washed away, and the solid surface of the guards can be cleaned with just an occasional spraying with a garden hose.

SLIP UNDER SHINGLES AND SCREW TO GUTTERS
Surface-tension guards work best if they're installed so the slope of the guard is similar to that of the roof. This may require rehanging existing gutters.
LeaFree, $10 per foot; get buying instructions at leafree.com.

The Family Handyman EDITORS' CHOICE

Best Overall

Surface-tension guards are just plain reliable if installed correctly. They're usually installed by pros, but DIYers can find them online or at local siding/roofing suppliers.

Pros:

- Withstands branches, snow, ice and strong winds.
- Keeps out the big stuff.
- More colors available.
- Needs little or no maintenance if installed correctly.
- Long-lasting.

Cons:

- Most expensive.
- Not as available: May have to order online or from a contractor.
- More difficult to install: Gutters may need to be rehung to accommodate them.
- More visible from the ground.
- Water can shoot over the guards in a heavy downpour.
- May not be an option on steel, tile, slate or wood roofs.

Prevent gutter clogs

Here are some tips that can prevent gutter clogs, even if you don't have gutter guards:
LARGER DOWNSPOUTS: Replacing 2 x 3-in. downspouts with 3 x 4-in. will help any debris that reaches the inside of your gutters to be washed away.
RIVETS INSTEAD OF SCREWS: Debris is more likely to get hung up on the sharp tips of machine screws. Rivets don't protrude as far and have a more rounded end.
PROPER PITCH: If your gutter doesn't pitch toward the downspout, even the smallest amount of debris will accumulate.

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THE FAMILY HANDYMAN DIY University

2015 Best in DIY

Fine mesh

$2 to $3 per foot

Fine-mesh guards function like screens, but they block all but the smallest debris. The tiny spaces in the mesh won't clog with seeds and needles, but they can fill with small particles like shingle grit. Fine-mesh gutter guards still need an occasional cleaning, but unlike screens, fine mesh is easy to blow or brush clean.

This EasyOn product can be installed under the shingles, or the back can be bent up and screwed to the fascia. This method strengthens the gutters themselves, making them hold up better to snow and ice avalanches, which are common with steel roofs in cold climates.

Fine-mesh products made with window-type screen material are easily damaged by ice and branches. The good ones will be made from tough surgical stainless steel.

ONE GUARD, TWO OPTIONS
This fine-mesh product can be installed under the shingles, or with the back bent up, it can be fastened to both the fascia and the gutter for added strength.
EasyOn Gutter Guard, $2 per ft., buy at costco.com (You don't need to be a member to buy online.)

The Family Handyman EDITORS' CHOICE

Best Value

Fine-mesh products need minimal maintenance and allow almost nothing in your gutters. We like the quality, flexibility and price of this EasyOn product.

Pros:

- Keeps everything out of the gutter.
- Higher-quality versions hold up to branches, snow, ice and strong winds.
- Easy to install.
- Can work with various roof types: shingles, shakes, steel, slate, tile, etc.
- Can use with old, brittle shingles.
- Can add strength to the gutter if installed flat.
- Easy to clean.

Cons:

- Not as widely available.
- Limited color choices.
- May need occasional maintenance/cleaning.

Skip the gutters altogether

If the ground slopes away from your house and you aren't having trouble with a wet basement, skip the gutters altogether and install a product like the Rainhandler system. It disperses the water and scoots it away from the house several feet, which prevents ruts in your landscaping and damage to deck boards, driveways and sidewalks. Check it out at rainhandler.com. Cost: about $4.50 per ft.

FOAM FILTERS

Foam filters are easy to install and cost less than $2 per ft. but they tend to get jammed with seeds and needles. Seeds sometimes sprout and grow in the foam.

I TEACH A CLASS OF 4TH GRADERS

with my RA pain

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Nobody chooses to have RA, but you do have control over how you live your life with it. If you feel like you're just getting by, talk to your doctor. But keep in mind that patients and rheumatologists often think about RA in different ways. Rethinking how you have the conversation could make a difference in what your doctor recommends.

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Farewell to ROY DOTY & WORDLESS WORKSHOP™

by Travis Larson
editors@thefamilyhandyman.com

We're sorry to report that our friend Roy Doty, the creator of Wordless Workshop, passed away this year at the age of 93.

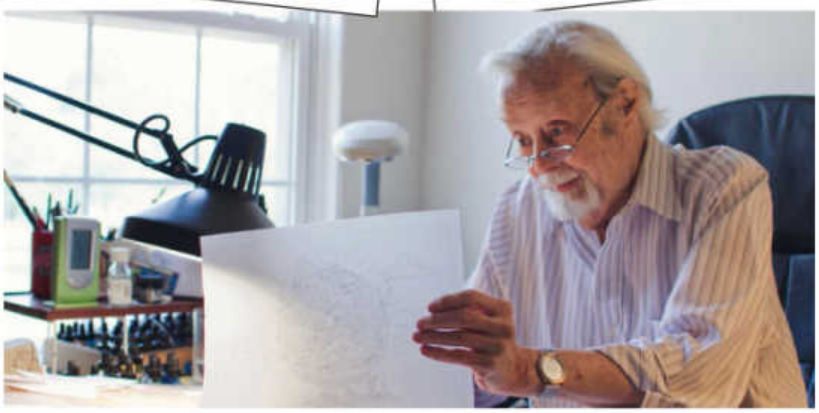
Roy was one of America's most prolific and longest-working cartoonists. He got his start after art school, just after the attack on Pearl Harbor. He was drafted into the Army and began drawing cartoons for "Why We Fight," "Overseas Woman" and "Stars and Stripes." Wordless Workshop is only one piece of his huge portfolio, but it's unique. It is the longest-running syndicated comic strip by a single artist in American history: nearly 60 years.

Wordless Workshop began in *Popular Science* in 1954. When *Popular Science* decided to drop it, *The Family Handyman* picked it up without missing a single month of publication. For the past 26 years, Roy created an original Wordless Workshop every month for us. It was lots of fun working with him, hearing his stories and just knowing him. And based on the fan mail we receive, we know all of you and your children and grandchildren will miss him as much as we do.

ART DIRECTION **MARY SCHWENDER**

Roy's inspiration—you!

Roy had a unique window into the minds of *The Family Handyman* readers because of the dozens of ideas he received from them every month. Each one of their sketches, diagrams and problem-solving ideas was a slice of Americana. Roy read those letters and studied people's clever solutions to problems, then chose which ones to illustrate. A few of the most popular categories are on the following page.

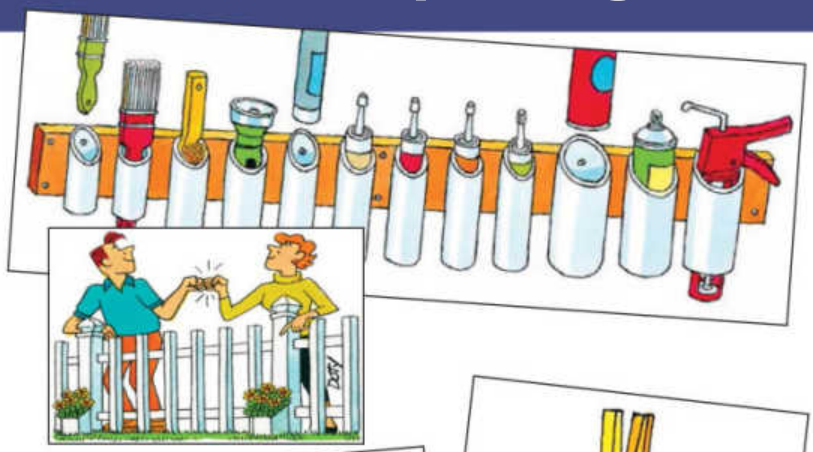


ARCHIVAL IMAGE COURTESY OF COLUMBUS COLLEGE OF ART & DESIGN

4 favorite Wordless Workshop™ categories

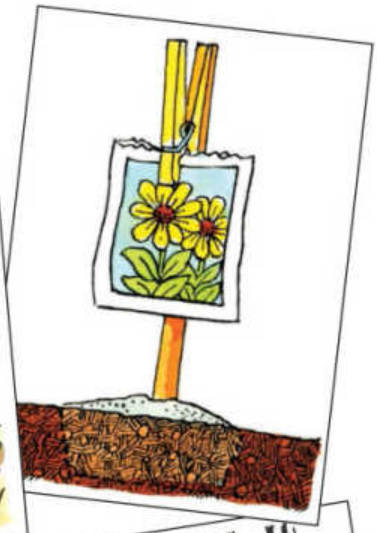
PVC

PVC pipe revolutionized plumbing. It also revolutionized the Wordless PVC contributions from readers. And why not? PVC is a material that's cheap, simple to cut and join, and then configure into anything short of a nuclear submarine. Roy and I would have to occasionally say to each other, "Man, oh, man, we've already done three PVC projects this year; we'd better hold on to this idea for an issue or two." The irony is that PVC pipe hadn't even been invented when Roy started Wordless Workshop.



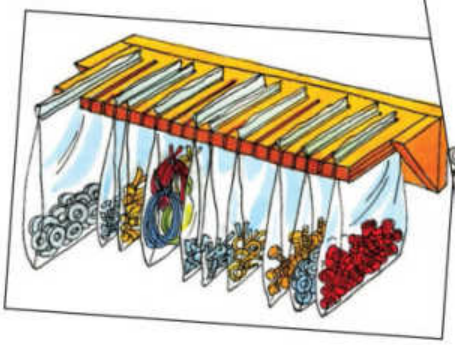
Lawn and garden

It's no surprise that gardening is a major passion for our readers. And you can see that reflected in the number of garden projects that Roy selected from the contributions. He wasn't all that interested in it himself, but Wordless topics weren't driven by Roy's hobbies; they were driven by contributor ideas. (If it had been all about Roy, you'd have seen a whole lot more stuff about golf!)



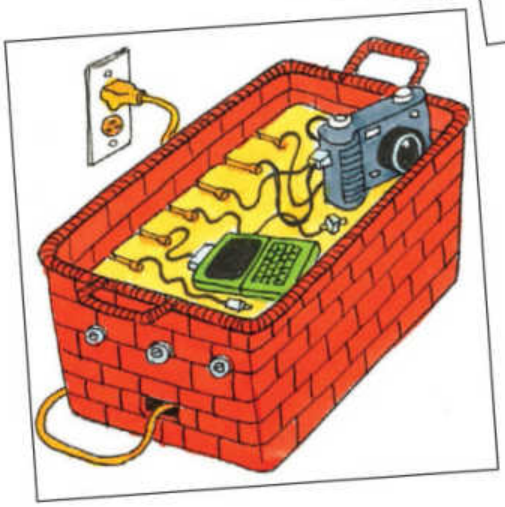
Storage and organization

Judging from the volume of storage and organizing submissions, the average *Handyman* reader is more organized than the Library of Congress. So that might be why the topic has been the dominant theme of Wordless Workshop since 1990. And if you study Roy's workstation on p. 49, you'll see that he too was a pretty organized guy.



High tech

Roy wasn't exactly a high-tech kinda guy. In fact, until a few years ago, we couldn't even e-mail him! But he eventually started faxing layouts instead of mailing them, and in the last few years, he actually scanned and emailed me layouts to review. And when it came to illustrating projects for high-tech devices like tablets, laptops and charging stations, he was all over it. He followed the whole high-tech march, beginning with projects for organizing vinyl records, then eight-track cassettes, VHS tapes, audiocassettes, CDs and DVDs.



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- Robert Forbes, M.D., California

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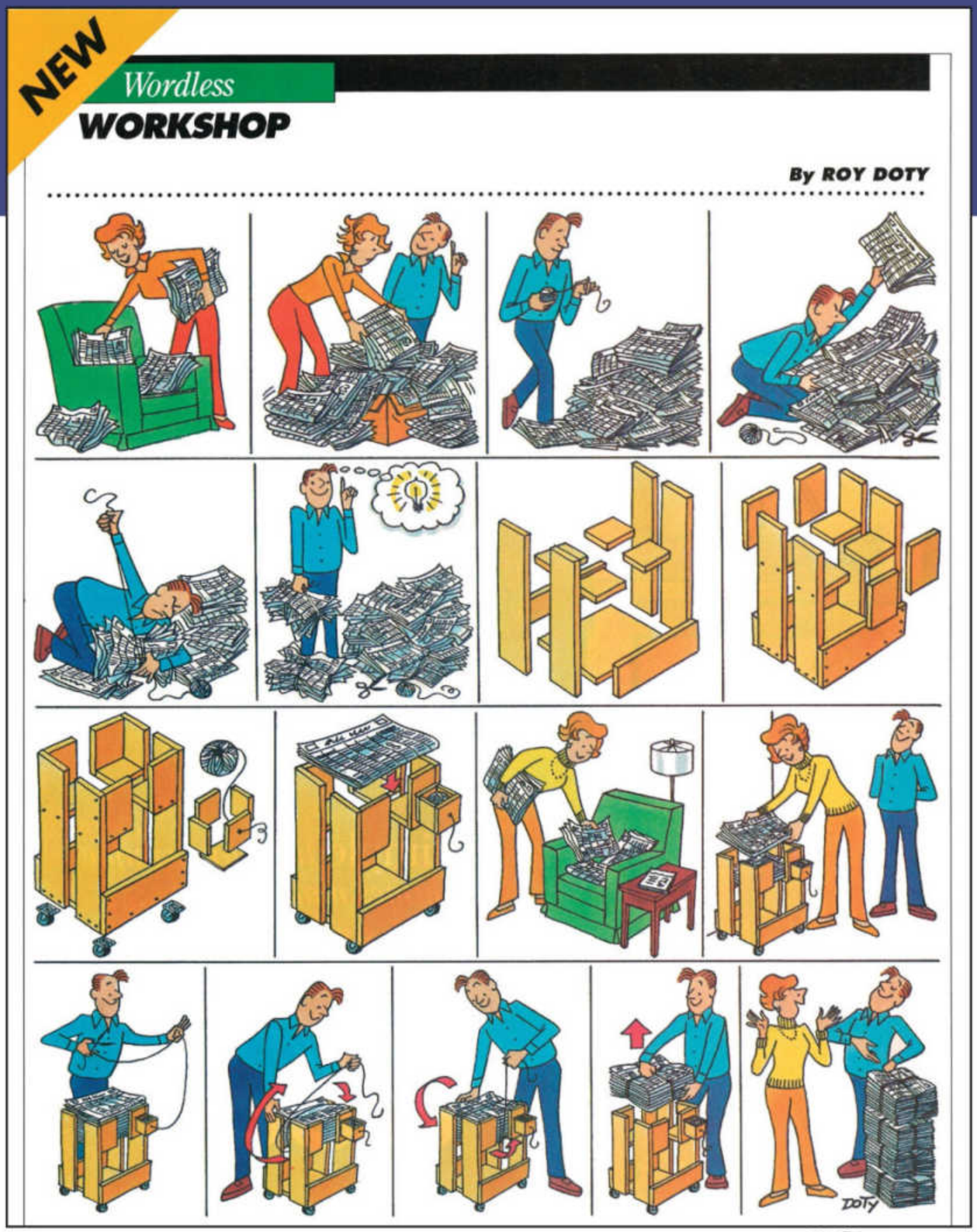
Our First Wordless Workshop™ 1990



The first Wordless Workshop appeared in our magazine in February 1990. Back then (maybe you remember), there were these quaint things called paper drives. This was Roy's way to simplify getting newspapers ready for the paper drive.

TIPS FOR A DECK REMODEL

GO TO THE PRO!
THE FAMILY Handyman

Our friends in the deck business tell us that "re-deck" projects are keeping them busy these days: They tear off the old wood decking and repair the deck's framing if needed. Then they install new decking, using low-maintenance composite deck boards. Usually, they install new railings, too. The homeowner gets a deck that looks completely new, without paying for new footings or framing. If that sounds good to you, check out these tips for a DIY re-deck.

by Gary Wentz
editors@thefamilyhandyman.com

Brace before tear-off

On many decks, the decking plays a big role in keeping the entire structure square. So add a diagonal brace under joists before you tear off the old decking. That will lock the joists in place and hold the deck square as you pull off the old boards and lay new ones. Leave the brace in place after you've installed the new decking; it will reduce side-to-side sway and make the deck feel more solid.

ART DIRECTION **MARY SCHWENDER** • PHOTOGRAPHY **HSP**

Add stair stringers

Most composites require that stair stringers be spaced no more than 12 in. apart ("on center"). But your existing stringers are probably 16 in. apart. To solve that problem, remove the center stringer or stringers (you can leave the side stringers in place). Mark out as many new stringers as you need, using a removed stringer as a pattern. Cut the new stringers and install them all—old and new—at the correct spacing.

Tear-off techniques

If your decking is nailed down, just pry up the boards. Here's a common approach: Pry up one end of each board with a flat pry bar, then use a big pry bar to do most of the work. If your deck is screwed down, tear-off will take more time. Remove all the screws you can with a drill/driver. When a stripped screw head prevents that, try to pry up the board. If that fails, you can drill into the head with a 1/4-in. bit. That will detach the head from the screw and allow you to pry the board off.

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Include splice boards

Decks are often larger than the longest deck boards available. The usual solution is to join the boards end-to-end, scattering the splices randomly across the deck. That's fine, but here's a better way: If your deck is 24 ft. long, for example, buy 12-ft. boards and run a "splice board" down the middle of the deck. The splice board will require some extra framing to support it and the adjoining deck boards, but the neat look is worth the trouble.

Flatten the joists

Most composite decking isn't as stiff as wood, so it won't bridge uneven joists as well. And that can mean a wavy deck surface. One pro we talked to always stretches a string across the joists and shaves down high spots with a planer. That adds an hour to the project but pays off with a flatter, better-looking deck.

PHOTO PAUL NELSON

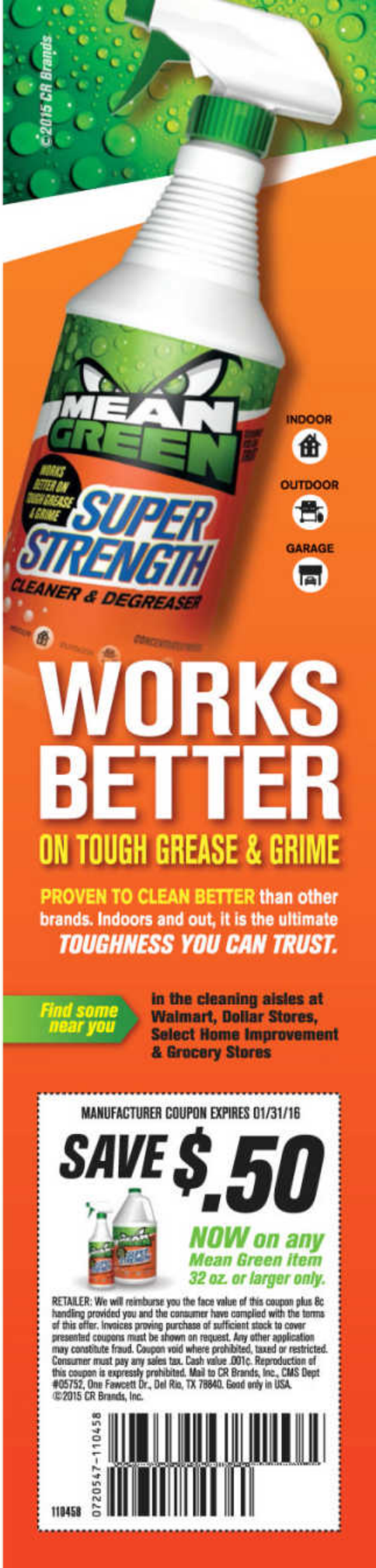
Don't limit your choices

You can stop by a home center and buy a load of in-stock composite decking. But don't restrict your selection that way. Instead, visit the materials desk and look at samples of what you can special-order. Or visit a showroom store that specializes in decking (search online for "decking supplies").

You'll see a wide range of prices, sometimes as low as $4 per sq. ft. and as high as $12. At the low end of the price range, you'll get solid coloring and a smooth texture or unconvincing imitation wood grain. Spending more will get you streaked coloring and textures that closely mimic real wood. You can also get a much tougher, stain-resistant surface by choosing composite that's "capped" with a layer of PVC. The capped decking shown here is from AZEK's Vintage Collection.

Add pizzazz with a pattern

Because it's available in various colors, composite decking makes borders and patterns easy. For design ideas and color combinations, visit manufacturer websites. The colors shown here are Harvest Bronze and Walnut Grove from AZEK's XLM line.



BY RICK MUSCOPLAT editors@thefamilyhandyman.com

Replace a noisy bath fan

If the bath fan in your home is more than 20 years old, chances are it's pretty loud. A loud fan may be good for masking bathroom noise, but the jet engine roar is downright annoying the rest of the time. Worse yet, your old bath fan may not be moving enough air to keep your bathroom free of mold and mildew.

Newer-style bath fans, on the other hand, are so quiet you can hardly hear them running, and they cost very little to operate. It's easier than you think to swap out that noisy, inefficient bath fan, especially if you choose one that's designed to be installed without ripping out the bathroom ceiling.

Of the many replacement models to choose from, we picked the NuTone No. RN110 Ultra Pro Series ($160 at supplyhouse.com) because the fan can be installed from inside the bathroom. It's not the quietest model available, but at 0.6 sones (about 25 decibels), it's a huge improvement over the old 4-sone (about 60 decibels) fan we're replacing. If you can locate a joist, cut drywall and handle basic electrical work, you can do the whole job in about two hours and save about $200 on the installation. You'll need a stud finder, a drywall saw, a drill and screws, and aluminum duct tape.

ART DIRECTION **MARCIA ROEPKE** • PHOTOGRAPHY **PAUL NELSON** • CONSULTANT **AL HILDENBRAND, MASTER ELECTRICIAN**

Buy the right size for your bathroom

There's no such thing as a "one-size-fits-all" bath fan. For bathrooms up to 100 sq. ft., calculate the required cubic feet per minute (cfm) by multiplying the room's length x width x height. Multiply that result by .13 and round up to the nearest 10. Example: 10 ft. wide x 9 ft. long x 9 ft. high x .13 = 105. Round up to 110 and buy a 110-cfm bath fan. For bathrooms larger than 100 sq. ft., simply add up the cfm requirements for each of these plumbing fixtures: toilet, 50 cfm; shower, 50 cfm; bathtub, 50 cfm; jetted tub, 100 cfm.

Turn off the power before proceeding

You'll have to remove the power cable from the old unit and connect it to the new fan. This must be done with the power off. Don't rely on turning off the fan switch; flip the breaker as well. Then double-check that the power is off with a voltage sniffer. If you're not comfortable working with electricity, hire an electrician to remove and connect the wires.

1 FIND THE JOISTS
Slide a stud finder along the ceiling until you find the joist nearest the old fan. Mark the location. Then find the joist on the opposite side of the fan.

2 MARK AND CUT THE CEILING OPENING
Using the template provided, trace the new opening onto the ceiling. Then cut along the lines using a drywall saw. Cut shallower strokes around the flexible duct so you don't puncture it.

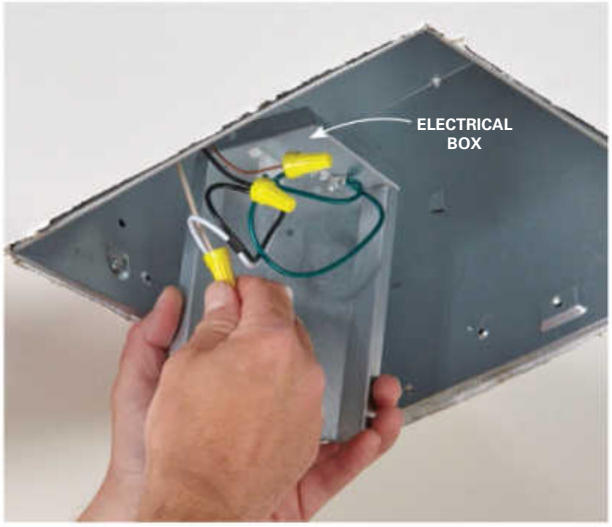
3 DISCONNECT AND REMOVE OLD PARTS
Unscrew the old fan housing from the joist. Then disconnect the electrical cable from the housing. Finally, slice through the duct sealing tape with a utility knife and disconnect the duct.

4 MOUNT THE BRACKET
Slide the bracket through the opening and extend it so it contacts the joists on each side of the opening. Secure both sides to the joists with drywall screws.

You may have to go into your attic

The installation we show here is all done from inside a bath with a floor above it. However, if you're replacing a bath fan in a bathroom with an accessible attic above it, you have the option of doing some of the work from up there. Use your judgment. You may save some mess by going into the attic and moving the insulation aside before you remove the old fan. Then rearrange the insulation after the installation is done. Or, eliminate the second trip by making the electrical and vent connections at the same time.

5 CONNECT THE DUCT
Pull the old duct through the housing and into the room. Then tape the duct to the damper assembly. Slide the damper onto the flange and secure with aluminum duct tape. Push the duct, damper and flange back into the ceiling and secure the flange to the housing using the screw provided.



6 CONNECT THE WIRES
Secure the hot (black), neutral (white) and ground (green/bare copper) wires with wire nuts. Then slide the metal electrical box into place in the housing and attach it with the screw provided.

7 INSTALL THE FAN AND GRILLE
Slide the fan assembly into the housing until it snaps in place. Secure with screws. Plug the electrical connector into the electrical box mounted earlier. Then screw in the noise-reducing muffler. Squeeze the grille springs and snap the grille into place.

Find the joists and duct and enlarge the opening

Most bath fans are mounted to a ceiling joist with the duct running parallel to the joist. Start by locating the direction of your ceiling joists (**Photo 1**). Then locate the damper (you may have to remove the fan motor and blade from the housing). That'll tell you where the duct lies in the ceiling. Mark the duct location. Then enlarge the opening (**Photo 2**).

Remove and replace the housing, duct and fan

With the opening now enlarged, you'll have room to disconnect the old duct, electrical cable and old housing (**Photo 3**). Install and secure the new mounting frame (**Photo 4**). Connect the electrical cable to the new housing and snap the housing into the frame so the duct opening is facing the existing duct. Then connect the duct, damper and flange using aluminum duct tape (**Photo 5**). Finish the rough-in by connecting the power wires and ground to the electrical box provided (**Photo 6**).

Then simply slide the fan into the housing and add the muffler and grille (**Photo 7**). Turn on the power and test. Apply a bead of fire-resistant (intumescent) caulk around the fan housing and drywall to prevent moisture intrusion into the attic.

CONTROL YOUR WATER HEATER REMOTELY WITH A SMARTPHONE

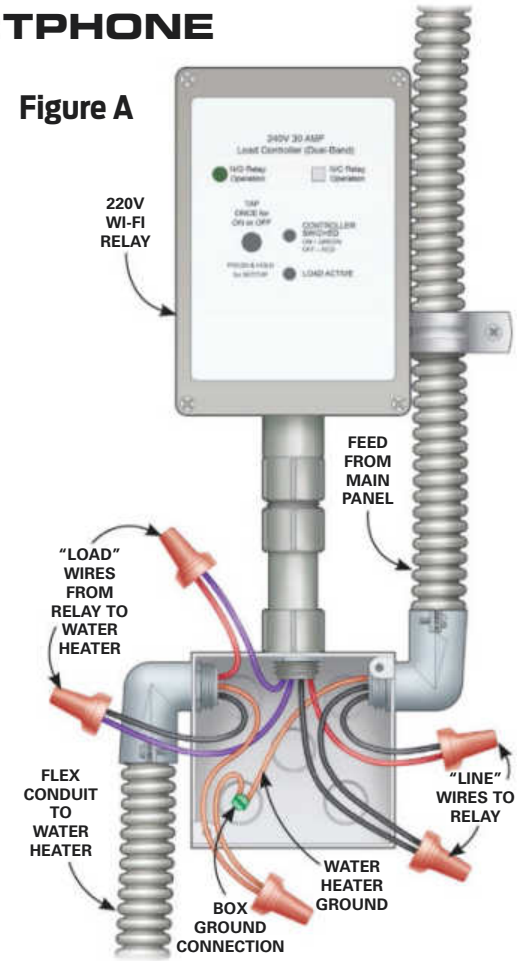
You can flip a breaker to turn off your electric water heater when you leave your cabin or vacation home. That'll save energy. But then you won't have hot water when you return. If your cabin or vacation home has Wi-Fi, you can use it, along with a hub and a relay, to control an electric water heater or well pump. We used an Insteon system (No. 2477sa1 relay, $100, and No. 2245-222 hub, $80, from smarthome.com) in this application, but there are many other brands available. If you're comfortable working with electricity, you can install the unit in a few hours. You'll need a 4-in. square metal utility box, black 10-gauge THHN wire, a square cover, armored flex conduit, flex connectors, and a hacksaw or a reciprocating saw with a metal-cutting blade.

Mount the relay and electrical utility box on the wall near the water heater. Then disconnect the flex conduit from the water heater and install it in one of the knock-outs on the new electrical box (**Photo 1**). Then cut a length of flex conduit to run from the electrical box to the water heater (**Photo 2**). Secure the flex conduit to the wall and water heater using 1-in. straps and screws.

Shove two lengths of 10-gauge black THHN wire and one bare copper wire into the flex conduit running between the electrical box and water heater. Connect the bare copper wire from the main panel to the green bonding screw in the electrical box. Then connect the bare copper wire from the water heater to the remaining portion of the copper wire using a wire nut (**Figure A**). Next, connect the "line" wires from the Wi-Fi relay to the feed wires coming from the main panel. Connect the "load" wires from the Wi-Fi relay to the wires coming from the water heater.

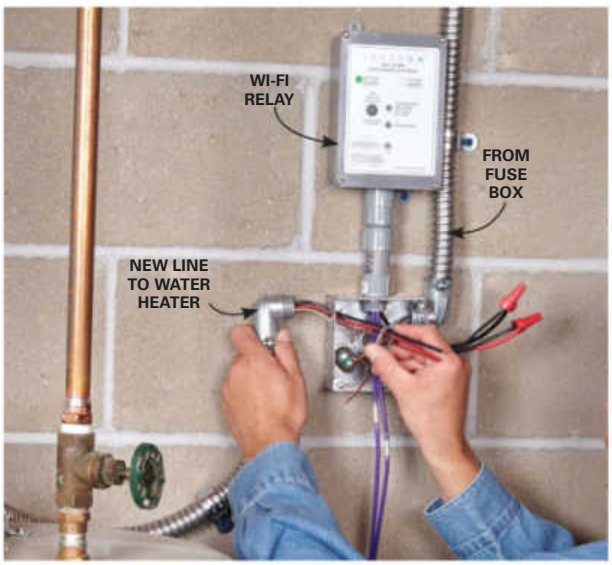
Power up the water heater and connect the Wi-Fi hub to your router. Download the app for your phone and configure and test the relay.

Figure A



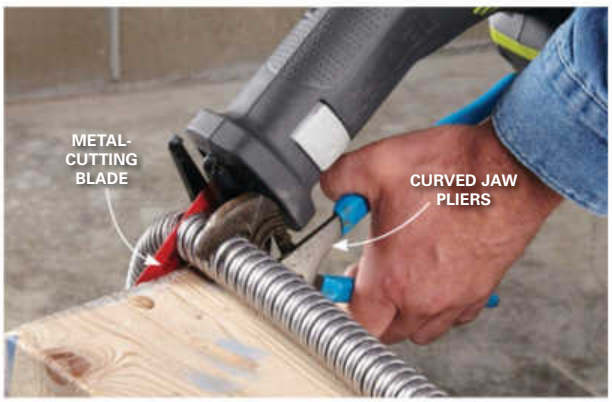
CONNECT THE WIRES

Secure the bare copper wire from the fuse box to a green grounding screw in the electrical box, leaving at least 6 in. for a pigtail. Connect the "line" wires from the relay to the feed wires from the fuse box using wire nuts. Connect the "load" wires from the relay to the wires going to the water heater and secure with wire nuts. Then connect the bare copper wire from the water heater to the bare copper pigtail using a wire nut. Fold all the wires neatly into the electrical box and install the cover. Connect the wires at the water heater.



1 CONNECT EVERYTHING TO THE JUNCTION BOX

Mount the Wi-Fi relay to the wall and connect to the box using 3/4-in. PVC conduit and fittings or a 3/4-in. offset. Secure the power-in and power-out flex conduit to the wall with straps within 8 in. of the box.



2 CUT FLEX CONDUIT

Measure out the length needed to span the space between the electrical box and the water heater. Clamp the flex conduit to a sawhorse using a curved-jaw pliers. Then cut straight through the conduit to get a square edge. Remove burrs and attach the connector.

Top Ten TIPS

BY GARY WENTZ editors@thefamilyhandyman.com

Spray-paint perfection

ART DIRECTION ELLEN THOMSON • PHOTOGRAPHY TOM FENENGA UNLESS NOTED

You've most likely never heard of Bonnie Seymour, but she did you a huge favor. In 1949, she suggested that her husband try putting paint in an aerosol can. He did, it worked, and painting got a whole lot easier. Here are some key tips for success with Bonnie's brilliant invention.

1 Plastic paint works!

Conventional spray paints just won't stick to plastic. Now paint manufacturers offer paint just for that application. These paints don't just stick; they fuse with the plastic surface to form a super-strong bond. Krylon Fusion for Plastic and Rust-Oleum 2x are two common brands.

Elevate your work

Don't set your project directly on a workbench or newspaper; the paint will glue it to the work surface. The best way to prop up wood furniture is to drive screws into the legs.

2 Light coats and patience prevent runs

The only sure way to avoid runs on a vertical surface is to spray on a light coat and give it a little drying time before the next. That's hard to do if you spray the surfaces in random order, but easy if you have a strategy. Start by coating each vertical surface. Spray lightly to avoid runs. Then hit the horizontal areas before starting the second round. Repeat each round in the same order. That way, each surface will get maximum drying time before you return to it. If any vertical surface still looks wet, stop and remember this: An extra five minutes of drying time now is better than sanding out runs and respraying later.

3 Overlap 50 percent

If you overlap just a little, you'll get stripes of heavy and light coverage. So instead, aim for 50 percent overlap, with each pass overlapping the previous pass about halfway.

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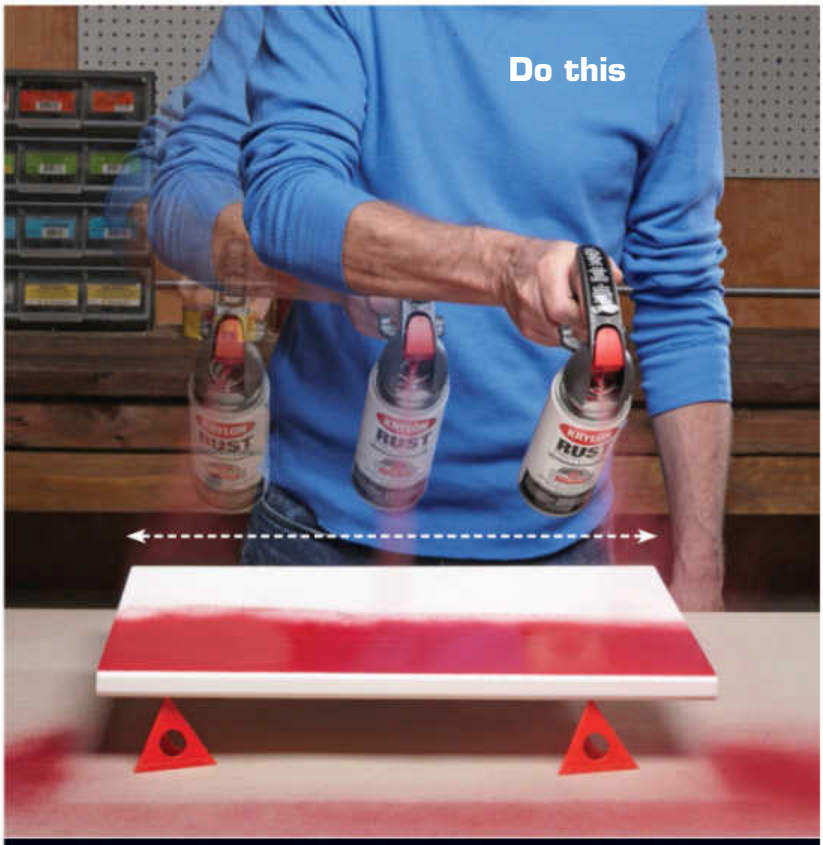
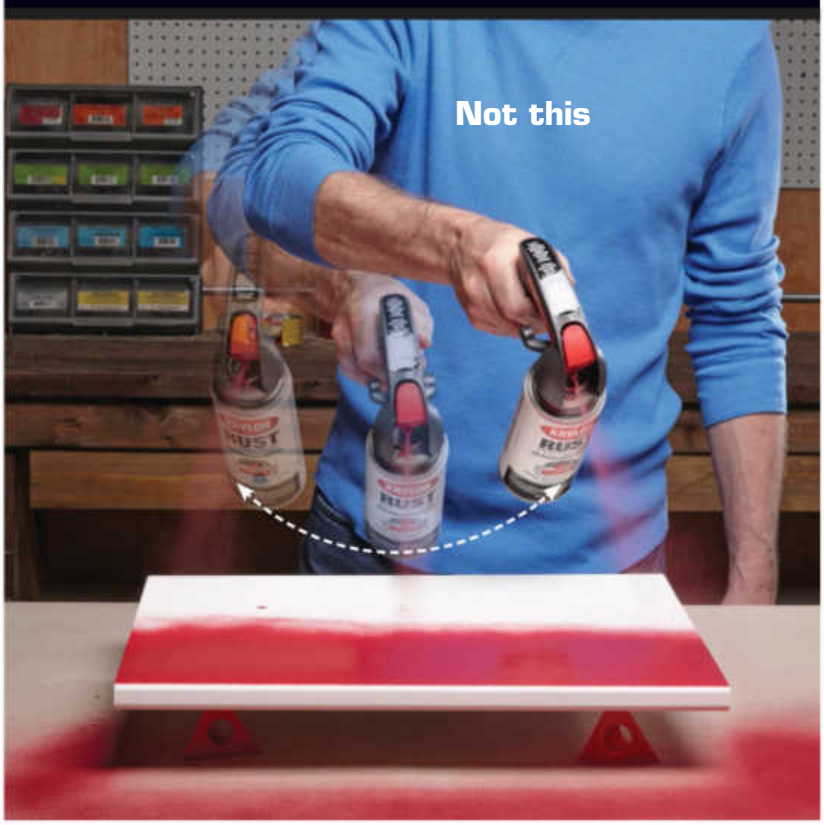


4 Don't swing an arc

It's the most natural motion for your arm, but swinging gives you heavy coverage in the middle of the project and light coverage at the ends. So move the can parallel to the surface, concentrating on straight, steady motion.



5 Get a handle

If you've ever sprayed a project that required several cans of paint, you already know about finger strain. For less than five bucks, a trigger handle not only prevents the pain but also gives you better control of the can.

6 Wear a respirator

Spray cans fill the air with fine mist and solvents. That's bad—really bad—for your lungs and nervous system. Working outside is the most effective way to avoid inhaling fumes, but a breeze may blow away most of the paint before it reaches the surface, while bugs and falling leaves wreck the finish. So it's often best to work indoors with doors and windows open. Most important, wear an organic vapor respirator ($25 at home centers). It will protect you, and you won't even smell the fumes.

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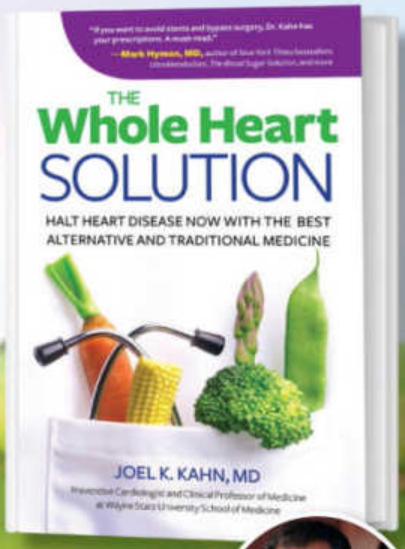

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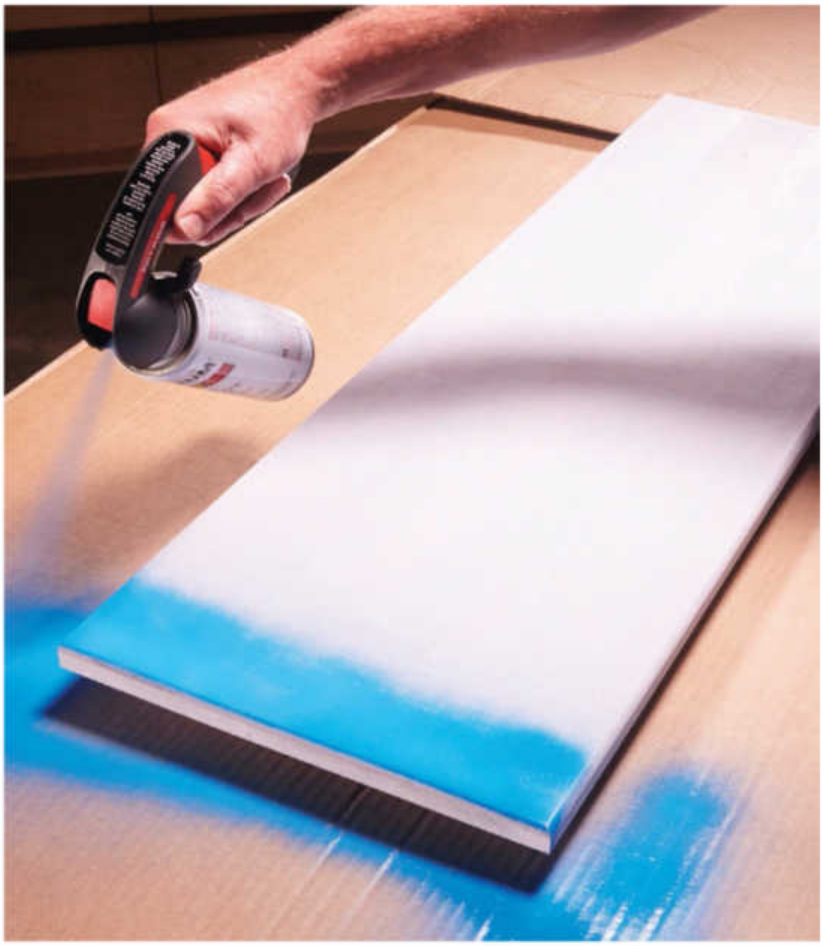

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7 Start before; stop after

Spray nozzles often spit out a few large droplets when you start spraying and again when you stop. To keep sputter spatter off your project, pull the trigger before you're over the target and release the trigger after you're past the edge.

HSP

8 Smooth a rough surface

If you want a smooth finish, pick the right primer. Some are formulated to fill pockmarks and scratches. Plus, they're sandable so you can smooth the surface before top-coating with paint.

HSP

9 Spin and spray

On some projects, you can walk miles circling the item to spray all the surfaces. Instead, pick up a lazy Susan at a discount store ($15) and save some legwork.

10 Two cans are faster—and sometimes better

Spray-painting a big surface isn't just slow; it can also lead to texture trouble. In warm, dry conditions, spray paint dries almost instantly, so very light "overspray" may land on nearby paint that's almost dry. When that happens, you get inconsistencies in the surface texture.

Here's how to get paint onto the project faster and get a consistent finish: Just hold a can in each hand. If you move each hand independently, one hand will stray off course. But if you hold the cans together, creating a single spray pattern, it's easy to stay on track. Keep in mind that this trick can lead to drips on vertical surfaces. Make faster passes and try a practice run on a scrap of cardboard.

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BY RICK MUSCOPLAT editors@thefamilyhandyman.com

Become an Internet mechanic

ART DIRECTION & GRAPHICS **VERN JOHNSON** • PHOTOGRAPHY **TOM FENENGA**

Cars have definitely become more complex, with computers running everything from the engine to the radio volume. But that doesn't mean you can't diagnose and fix your car yourself with a little help from the Internet. There's so much good information online now that DIY car repair has never been easier. By visiting the right car forums, you can get help diagnosing the problem, learn how to do the repair and find the correct parts at good prices. And if you get stuck, you can even get advice from fellow owners and professional mechanics.

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Rick Muscoplat, TFH gearhead

I volunteer on several auto repair Q&A sites, helping DIYers diagnose and repair their own vehicles. And I write an auto repair blog at **ricksfreeautorepairadvice.com**. My site contains more than 1,300 articles covering the most common car and truck problems, and they're all free. The advice listed here comes from years of experience helping online DIYers.

I'll show you how to locate and use Internet sites to get the answers you need to diagnose and fix your car. And I've included links to sites where professional mechanics volunteer and other sites where you can talk to a professional mechanic for a small fee. Once you review all online posts and get advice from others who've done the repair, you can decide whether you're up for doing the repair yourself. If not, check out our Internet source to help you locate an independent repair shop near you.

DIAGNOSE THE PROBLEM

When a problem shows up repeatedly on a specific vehicle model, people write about it online. You can save a lot of time simply by searching what others have done to diagnose and fix the problem. Here's how to find that information:

1 If the "Check Engine" or "Service Engine Soon" light is on, get the trouble codes read for free at most auto parts stores, or buy your own code reader for less than $40 (one choice is the Autel MaxiScan MS300; $19 at amazon.com).

2 Then search for solutions using any online search engine. Enter the trouble code along with your make and model, like this: "P0420 on 2003 Ford Taurus." If the "Check Engine Light" isn't on or you're dealing with another type of problem, search for results based on the symptom, like this: "clunking sound over bumps on 2001 Honda CRV."

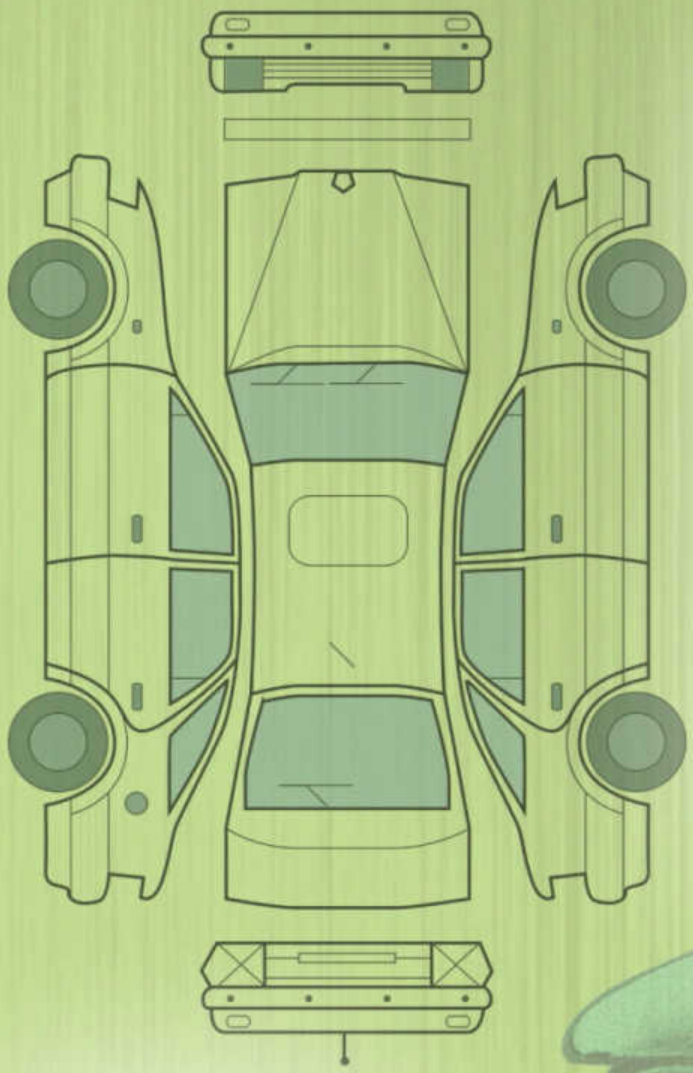
3 If the search results don't address the problem, find a vehicle-specific auto repair forum. Search by entering your vehicle's model, followed by the word "forum," like this: "Ford F-150 forum." Search the forum's archives first to see if others have had the same problem. If not, post your problem on the Q&A section of the forum and wait for replies.

LEARN THE LINGO BEFORE POSTING YOUR QUESTION

There's a right way and a wrong way to ask a question in a car forum. For example, if your car won't start, don't just ask: "Why won't my car start?" Instead, give meaningful details: "2009 Pontiac Vibe cranks but won't fire up when cold." Always include the year, make and model, along with a detailed description of the problem and when you encounter it, such as when it's cold or hot, when turning left, at speeds less than 30 mph, etc.

1 If you come up empty using a search engine and a vehicle-specific forum, try a site frequented by professional mechanics. Here's a list of places frequented by volunteer professional mechanics: gminsidenews.com/forums/f53/, batauto.com, reddit.com/r/MechanicAdvice, 2carpros.com, ricksfreeautorepairadvice.com

2 Pay to talk or email one-on-one with a professional mechanic at an online help service like expertcaradvice.com or justanswer.com. The services contract with mechanics from dealers and independent repair shops and route your question to an expert who works on your car's brand every day.



LEARN HOW TO DO THE REPAIR

You can't decide if you're up to doing the repair yourself until you know the steps involved and the tools required. Find that information online. Then decide whether to fix it yourself or take it to a pro.

1 For step-by-step instructions, specifications, factory service bulletins, wiring diagrams and illustrations, buy a subscription to a professional online shop manual. The two best online manuals are **alldatadiy.com** and **eautorepair.net**. Check your local library to see if it offers online repair manual access.

2 Search for repair videos this way: "replace power steering pump 2005 Dodge Grand Caravan video." Or go directly to YouTube and search for repair videos there. But use common sense when viewing these amateur videos, and watch several before deciding if there's a common thread when it comes to the fixes. Some of the techniques you'll come across are not only wrong; they can be downright dangerous.

GET THE BEST DEAL ON PARTS

The best source for replacement parts is the dealer, but it's typically the most expensive. However, many dealers now sell genuine manufacturer parts online at a discount. And, retail auto parts stores also offer online discounts. So shop online first, then ask whether the parts store or dealer will match the online price.

1 Search for discounted dealer parts like this: "genuine Dodge discount parts."

2 Search for coupon codes for auto parts retailers like this: "AutoZone coupon code."

3 Find a non-dealer discount online parts seller like this: "Discount auto parts." **Rockauto.com, frugalmechanic.com** and **autoanything.com** offer great deals on replacement auto parts.

Clip this section and keep it near your toolbox:

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PRO tips

BY MARK PETERSEN editors@thefamilyhandyman.com

ART DIRECTION ELLEN THOMSON • PHOTOGRAPHY TOM FENENGA

Skid steer attachments

If you own a skid steer, have access to one or plan to rent one for an upcoming project, here are some handy attachments you should know about. We couldn't possibly show you the dozens of attachments available, so we talked with several dealers to see which ones they sell and rent the most. Our pro, Mike Doyle, a longtime heavy-equipment operator, gave us great tips to help you get your money's worth from these popular attachments. And yes, a lot of these are as fun to use as they look.

Approach

Roll and crunch

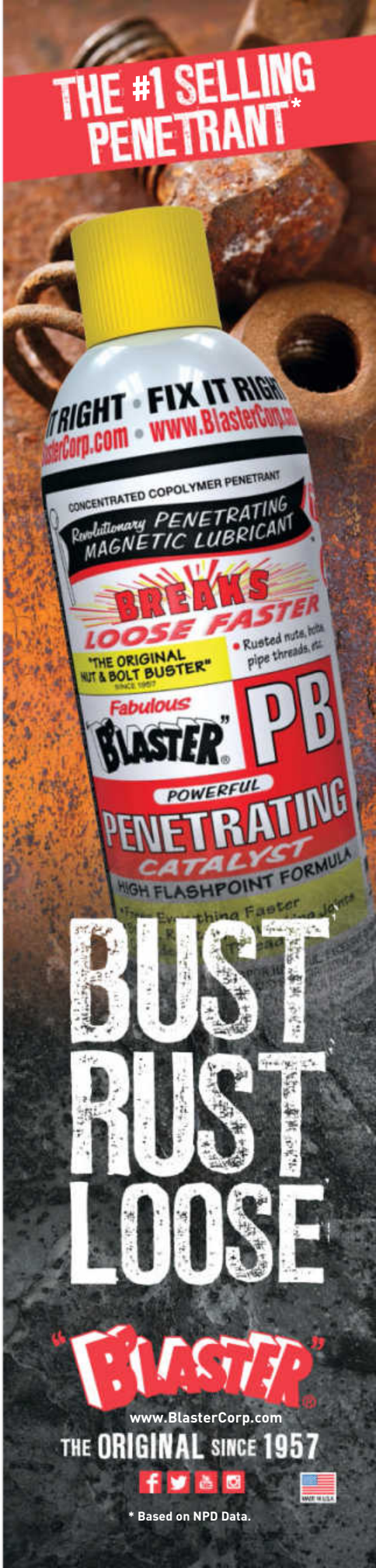
Lift

Move brush with a grapple

You can move mountains of brush with this grapple attachment by following these steps. First, **approach** the pile with the bottom teeth parallel to the ground, and keep driving until the whole pile starts to move forward. Next, **roll** the grapple over as you keep advancing. Finally, **crunch** the upper teeth down, and **lift** the pile off the ground. As with any load, keep it as low to the ground as you can while transporting it.

This grapple is made for brush, but there are grapples made for all sorts of other jobs like demo, moving rocks, pulling roots and handling hay.

Cost to rent the attachment: $125 per day/$425 per week.



Move snow

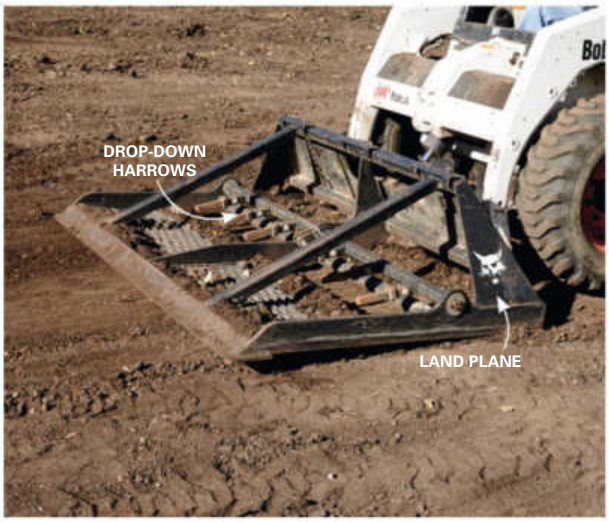
Lots of power and great maneuverability make skid steers snow-moving rock stars. Snow buckets are twice the size of standard buckets and work well for pushing and piling up snow. When you're plowing snow on a gravel driveway, keep the bucket raised a bit or you'll inadvertently scoop up a bunch of gravel along with the snow. Snow buckets also work well for light loads like leaves, grass and wood chips, but never use them to move dirt or rocks because you could damage the machine. Cost to rent the attachment: $60 per day/$200 per week.

SCOOP UP ROCKS AND RUBBLE

It's a lot easier to scoop up rocks and rubble with a bucket that has teeth on it. Teeth also work well for pulling up roots and digging in tough soil conditions. Some buckets have teeth welded on, but the ones shown here can be removed when they're not needed. Your rental center will charge an extra $40 to add teeth to a bucket.

LEVEL THE GROUND

A regular bucket is OK for grading, but a grading bar/land plane works much better. They're usually designed with two cutting edges so you can level the ground in both forward and reverse—that cuts your work time in half! They're also handy for pulling up and capturing rocks without creating a giant trench. The one shown has harrows that can be dropped down to break up sod and tough soils. There are several sizes designed for different size steers.
Cost to rent the attachment: $60 per day/$250 per week.



Handle pallets

Forks for a skid steer are great for moving around pallets of pavers, large fuel tanks, engine blocks, big boulders, old slabs of sidewalk, lumber, logs, hay bales ... you get the idea. Every skid steer can lift only so much. It's a good idea to know what that limitation is, especially when unloading pallets from a trailer.
Cost to rent the attachment: $40 per day/$160 per week.

MOW DOWN SMALL TREES AND TALL GRASS

Knock down acres of tall grass and brush in one day with a rotary brush cutter. They come in various sizes to match the skid steer you'll be running. This one can devour trees up to 3 in. in diameter! Some come with rear rollers and front casters to achieve a smoother cut.
Cost to rent the attachment: $175 per day/$550 per week.

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BUST UP CONCRETE

If busting up concrete with a sledgehammer is one of the worst jobs out there, busting up concrete with a skid steer just might be one of the most fun ... honestly! There's not a lot of bouncing around, and the whole machine jiggles your body like a vibrating easy chair. Always start breaking the concrete at the edges, and clear away the debris as you go so you don't poke a hole in a tire on an exposed hunk of rebar.

Cost to rent the attachment: $170 per day/$450 per week.

MEET THE EXPERT

Mike Doyle worked as a heavy-equipment operator for 45 years. He's run everything from a 5,000-lb. skid steer up to an 85-ton excavator that required two low-boy trailers to transport.

Dig holes

A skid steer equipped with an auger can drill holes faster than you can say "Wow, what a back-saver!" Gravel, hard clay soils, rocks (not boulders) and tree roots don't stand a chance. Regular augers work great for fence posts and footings, but large augers, like the 30-in. one shown here, make quick work of planting trees. Pull up the auger occasionally to clear the dirt. Most augers spin in both directions, so if you dig down too far and get stuck, spin it in reverse as you pull it up.
Cost to rent the attachment: $125 per day/ $450 per week.

GRIND STUMPS

A stump grinder attached to a skid steer will obliterate a stump in minutes. The basic model shown here requires the whole skid steer to be repositioned in order to move the cutting wheel. Higher-end models allow you to swing the arm independently of the machine. Some grinders are mounted on the side and others are in the middle. The location of the grinder may make a difference if you have stumps near buildings or in tight quarters, so ask before you pick it up. Cost to rent the attachment: $200 per day/ $700 per week.

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SUPER COUPON

STEP STOOL/ WORKING PLATFORM

HaulMaster

LOT 62515
66911 shown

- 350 lb. Capacity

SAVE 42%

$19.99
REG. PRICE $34.99

52090885

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SUPER COUPON

SAVE 45%

POWDER-FREE NITRILE GLOVES PACK OF 100

HARDY

- 5 mil. thickness

YOUR CHOICE!

$6.49
REG. PRICE $11.99

MEDIUM
LOT 68496/61363

LARGE
LOT 68497/61360

X-LARGE
LOT 61359
68498 shown

52037675

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SUPER COUPON

20% OFF

ANY SINGLE ITEM

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52048781

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WOW SUPER COUPON

2 HP INDUSTRIAL 5 MICRON DUST COLLECTOR

CENTRAL MACHINERY

LOT 61790/97869 shown
- 70 Gallon Capacity

$169.99
REG. PRICE $249.99

SAVE $80

52052745

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WOW SUPER COUPON

44", 13 DRAWER INDUSTRIAL QUALITY ROLLER CABINET

US★GENERAL PRO

LOT 68784 shown
69387/62270/62591/62744

SAVE $330

- Weighs 245 lbs.

$369.99
REG. PRICE $699.99

52037073

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WOW SUPER COUPON

CENTRAL MACHINERY

8", 5 SPEED BENCH MOUNT DRILL PRESS

LOT 62390
62520
60238 shown

SAVE $80

$49.99
REG. PRICE $129.99

52040893

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SUPER COUPON

18 GAUGE BRAD NAILER

CENTRALPNEUMATIC

LOT 62255/68021 shown

WE CARRY A FULL LINE OF FASTENERS

SAVE 60%

$13.99 ~~$18.99~~
REG. PRICE ~~$34.99~~

52054128

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SUPER COUPON

drillmaster

80 PIECE ROTARY TOOL KIT

LOT 97626 shown
68986/69451

SAVE 68%

$7.99
REG. PRICE $24.99

52074818

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SUPER COUPON

6" DIGITAL CALIPER

PITTSBURGH

LOT 47257 shown
61585/62387

Includes two 1.5V SR44 button cell batteries.

SAVE 65%

$10.99
REG. PRICE $31.99

52044025

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SUPER COUPON

RAPID PUMP® 1.5 TON ALUMINUM RACING JACK

PITTSBURGH

LOT 69252
60569/62160
62496/62516
68053 shown

SAVE $60

- 3-1/2 Pumps Lifts Most Vehicles
- Weighs 27 lbs.

$59.99
REG. PRICE $119.99

52101597

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SUPER COUPON

EIGHT DRAWER WOOD TOOL CHEST

WINDSOR DESIGN

LOT 62585
94538 shown

SAVE $30

$69.99
REG. PRICE $99.99

52056238

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SUPER COUPON

2.5 HP, 12" PLANER

CENTRAL MACHINERY

LOT 62555/95082 shown

$239.99
~~$289.99~~
REG. PRICE $329.99

SAVE $90

52052589

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SUPER COUPON

SAVE 40%

MOVER'S DOLLY

HaulMaster

LOT 60497/93888 shown
61899/62399

- 1000 lb. Capacity

$8.99
REG. PRICE $14.99

52119287

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600 Stores Nationwide

WOW SUPER COUPON

Customer Rating ★★★★☆

14" OSCILLATING SPINDLE SANDER

CENTRAL MACHINERY

LOT 69257 shown
95088/62146

- Heavy duty cast iron table
- Dual action spindle rotates and oscillates for smooth finish
- Dust collection port

SAVE $50

$99.99

~~$139.99~~ REG. PRICE $149.99

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52169216

SUPER COUPON

FREE

WITH ANY PURCHASE

3-1/2" SUPER BRIGHT NINE LED ALUMINUM FLASHLIGHT

LOT 69052 shown
69111/62522/62573

$6.99 VALUE

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52172768

SUPER COUPON

16" VARIABLE SPEED SCROLL SAW

CENTRAL MACHINERY

LOT 62519/93012 shown

$59.99

REG. PRICE $119.99

SAVE $60

52123304

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SUPER COUPON

60", 4 DRAWER HARDWOOD WORKBENCH

LOT 69054/62603/93454 shown

SAVE $110

WINDSOR DESIGN

$139.99 REG. PRICE $249.99

52144251

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SUPER COUPON

24" CLAMP AND CUT EDGE GUIDE

LOT 66126

PITTSBURGH

SAVE 52%

$7.99

REG. PRICE $16.99

52154048

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WOW SUPER COUPON

2 HP, 8 GALLON 125 PSI PORTABLE AIR COMPRESSOR

CENTRALPNEUMATIC

SAVE $40

LOT 67501 shown
68740/69667

$99.99 REG. PRICE $139.99

52170000

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WOW SUPER COUPON

PACIFIC HYDROSTAR

1650 PSI PRESSURE WASHER

LOT 69488
- 1.3 GPM

SAVE $50

$79.99

~~$99.99~~ REG. PRICE $129.99

52120054

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SUPER COUPON

29 PIECE TITANIUM NITRIDE COATED HIGH SPEED STEEL DRILL BIT SET

NEW

WARRIOR

LOT 61637 shown
5889/62281

SAVE 60%

$9.99

REG. PRICE $24.99

52137606

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SUPER COUPON

12" SLIDING COMPOUND DOUBLE-BEVEL MITER SAW WITH LASER GUIDE

NEW

CHICAGO ELECTRIC POWER TOOLS

LOT 61776/61969
61970/69684 shown

SAVE $165

$134.99

REG. PRICE $299.99

52143385

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SUPER COUPON

16 OZ. HAMMERS WITH FIBERGLASS HANDLE

PITTSBURGH

CLAW
LOT 69006/47872
60715/60714

RIP
LOT 47873 shown
69005/61262

YOUR CHOICE!

SAVE 62%

$2.99 REG. PRICE $7.99

52147869

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SUPER COUPON

CHICAGO ELECTRIC WELDING

90 AMP FLUX WIRE WELDER

LOT 68887 shown
61849/62719
- No Gas Required

SAVE $50

$99.99 REG. PRICE $149.99

WE CARRY A FULL LINE OF WELDING WIRE

52148141

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SUPER COUPON

60 LED SOLAR SECURITY LIGHT

Bunker Hill Security

LOT 62534
69643 shown

SAVE 46%

Includes 6V, 900 mAh NiCd battery pack.

$31.99 REG. PRICE $59.99

52148978

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SUPER COUPON

US★GENERAL PRO

30", 5 DRAWER TOOL CART

LOT 69397
61427
95272 shown
- 704 lb. Capacity

SAVE $180

$169.99

REG. PRICE $349.99

52120222

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SUPER COUPON

1/4" TRIM ROUTER

drillmaster

LOT 61626
62659
44914 shown

SAVE 63%

$19.99

REG. PRICE $54.99

52135784

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SUPER COUPON

12 VOLT, 10/2/50 AMP BATTERY CHARGER/ ENGINE STARTER

CENTECH

SAVE 62%

LOT 60653 shown
66783/60581/62334

$29.99

REG. PRICE $79.99

52140842

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SUPER COUPON

Haul Master

1000 LB. CAPACITY SWING-BACK TRAILER JACK

LOT 69780
41005 shown

SAVE 50%

$19.99 REG. PRICE $39.99

52172924

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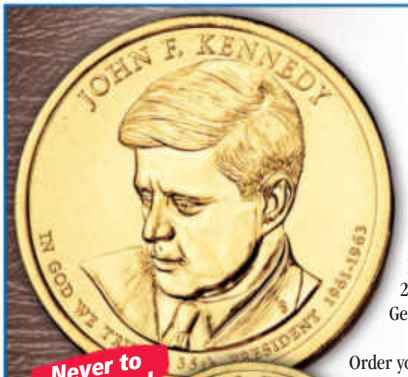

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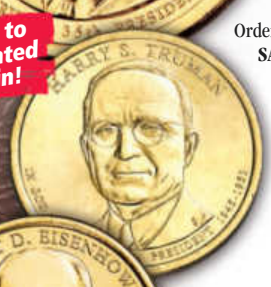

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Cell Phone Inspires Chicago Doctor to Design Affordable Hearing Aid

Outperforms Most Higher Priced Hearing Aids

Reported by J. Page

CHICAGO: A local board-certified Ear, Nose, and Throat (ENT) physician, Dr. S. Cherukuri, has just shaken up the hearing aid industry with the invention of a medical-grade, affordable hearing aid. **This revolutionary hearing aid is designed to help millions of people with hearing loss who cannot afford —or do not wish to pay—the much higher cost of traditional hearing aids.**

- **Designed by A Board-Certified Ear, Nose, and Throat (ENT) Doctor**
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"Perhaps the best quality-to-price ratio in the hearing aid industry" — **Dr. Babu, M.D. Board-Certified ENT Physician**

Dr. Cherukuri knew that untreated hearing loss could lead to depression, social isolation, anxiety, and symptoms consistent with Alzheimer's dementia. **He could not understand why the cost for hearing aids was so high when the prices on so many consumer electronics like TVs, DVD players, cell phones, and digital cameras had fallen.**

Since Medicare and most private insurance do not cover the costs of hearing aids, which traditionally run between $2,000-$6,000 for a pair, many of the doctor's patients could not afford the expense. Dr. Cherukuri's goal was to find a reasonable solution that would help with the most common types of hearing loss at an affordable price, not unlike the **"one-size-fits-most" reading glasses** available at drug stores.

He evaluated numerous hearing devices and sound amplifiers, including those seen on television. Without fail, almost all of these were found to amplify bass/ low frequencies (below 1000 Hz) and not useful in amplifying the frequencies related to the human voice.

Inspiration From a Surprising Source

The doctor's inspiration to defeat the powers-that-be that kept inexpensive hearing aids out of the hands of the public actually came from a new cell phone he had just purchased. **"I felt that if someone could devise an affordable device like an iPhone® for about $200 that could do all sorts of things, I could create a hearing aid at a similar price."**

Affordable Hearing Aid With Superb Performance

The high cost of hearing aids is a result of layers of middlemen and expensive unnecessary features. Dr. Cherukuri concluded that it would be possible to develop a medical-grade hearing aid with out sacrificing the quality of components. The result is the **MD**HearingAid ***PRO***, well under $200 each when buying a pair. **It has been declared to be the best low-cost hearing aid that amplifies the range of sounds associated with the human voice without overly amplifying background noise.**

Tested By Leading Doctors and Audiologists

The **MD**HearingAid ***PRO*** has been rigorously tested by leading ENT physicians and audiologists who have unanimously agreed that the **sound quality and output in many cases exceeds more expensive hearing aids.**

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"I have been wearing hearing aids for over 25 years and these are the best behind-the-ear aids I have tried. ***Their sound quality rivals that of my $3,000 custom pair of Phonak Xtra digital ITE."***
—Gerald Levy

"I have a $2,000 Resound Live hearing aid in my left ear and the **MD**HearingAid® ***PRO*** *in the right ear.* ***I am not able to notice a significant difference in sound quality between the two hearing aids."*** —Dr. May, ENT Physician

"They work so great, my mother says she hasn't heard this well in years, even with her $2,000 digital! ***It was so great to see the joy on her face.*** *She is 90 years young again."*
—Al Peterson

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DIY Quiz

BY GARY WENTZ editors@thefamilyhandyman.com

Put on your thinking cap and take this month's quiz to see just how smart you are when it comes to DIY. Here's how it works:

- There are easy, intermediate and really tough questions all mixed together.
- There may be more than one correct answer!
- Find the answers and get your DIY rating on pp. 90 – 91. Good luck!

ART DIRECTION ELLEN THOMSON • PHOTOGRAPHY HSP

1. When building a retaining wall, why is it smart to backfill with gravel rather than soil?

A. Gravel is easier to handle than soil.
B. Gravel provides excellent drainage.
C. Rodents won't tunnel through gravel.
D. Soil contact harms some wall materials.

2. If you find dead bugs like these inside your home, you should:

A. Evacuate the house.
B. Call an exterminator.
C. Seal gaps in your attic.
D. All of the above.

3. True or False? Connecting a power tool to a light-duty extension cord can damage the motor.

4. What is this tool for?

A. Scraping paint
B. Removing caulk
C. Fluffing compacted carpet
D. Straightening air conditioner fins

5. This stair rail doesn't meet current building codes. Why?

A. It has no "return" at the end.
B. It's not properly fastened to the wall.
C. It's on the wrong side of the stairs.
D. Round or oval rails are now prohibited.

6. Harry Handyman's window trim work was flawless—every miter was airtight. But a few months later, they all looked like this. What happened?
A. He didn't use enough nails.
B. Window sealants caused the jamb to bow inward.
C. High summer humidity caused the wood to swell.
D. The subfloor settled.

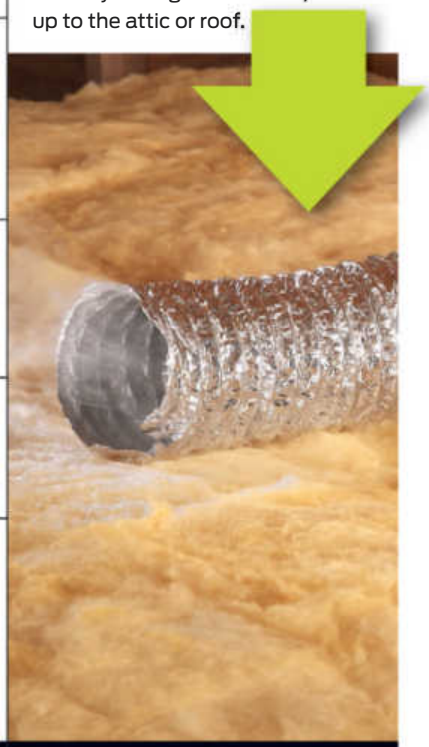
7. What's wrong with this plumbing?
A. The type of trap shown is prohibited by code.
B. The pipes are undersized.
C. The dishwasher hose is incorrectly installed.
D. Nothing.

8. True or False? Energy-saving T-8 fluorescent bulbs work just fine in older fixtures designed for T-12 bulbs.

9. Which is the correct way to install an outlet?
A. Ground up
B. Ground down
C. Both are fine.

10. If you're installing footings for a deck or other outdoor structure, you need to consider:
A. Frost depth
B. Soil salinity
C. Moisture capacity
D. All of the above

11. What's wrong with this bath fan duct?
A. Nothing. If an attic is properly ventilated, it's best to vent into the attic.
B. A bath fan should never vent into the attic.
C. A bath fan duct should be insulated to limit condensation inside the duct.
D. A bath fan duct should run horizontally through a side wall, never up to the attic or roof.



12. True or False? When grout begins to harden before you're done using it, you should add a very small amount of water to extend the "working time."

13. True or False? Asbestos fumes from building materials like siding or insulation are a serious health threat.

14. True or False? For the longest-lasting exterior paint job, use oil-based paint.

15. What's the most dangerous place in a home?
A. The kitchen
B. The bathroom
C. Stairways
D. The garage

Find the DIY Quiz answers on pp. 90 – 91.

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DIY Quiz Answers

1. (**B**) Drainage is the key to a lasting retaining wall. "Saturated soil" (the technical term for mud) exerts tremendous pressure and can move almost any wall. But gravel, along with drain tile, allows water to drain and keeps the soil from becoming saturated.

4. (**D**) A fin comb straightens the delicate fins on an air conditioner. Crushed fins constrict airflow and reduce the efficiency of the unit. With a fin comb, you can solve that problem in minutes, whether it's a window air conditioner or the outdoor unit of a central A/C system. You can get a fin comb set for about $12 online.

2. (**B**) Call an exterminator. These winged termites are called "swarmers." Every spring, hundreds of swarmers leave each colony to establish new colonies. So if you find swarmers inside your home, there may be a thriving termite colony feeding on your house. Save a few of the swarmers in a plastic bag to help the exterminator identify the type.

5. (**A**) New rails must include a return, which butts against the wall. Without a return, sleeves or purse straps can catch on the end of the rail, causing a fall.

3. True. "Voltage drop" occurs in any extension cord, and the longer and thinner the cord, the more voltage drops. Low voltage causes electric motors to run hotter, which can damage the motor. Here's a handy chart to help you match an extension cord to your tool. You'll find the cord's gauge marked on the outer insulation (16/3, 14/3, etc.). Find the tool's amp rating on the motor housing.

CURRENT LIMITS ON EXTENSION CORDS (AMPS)

Cord Size	Cord Length		
	25 ft.	50 ft.	100 ft.
18-gauge	7 amps	4 amps	2 amps
16-gauge	12 amps	7 amps	3.4 amps
14-gauge	16 amps	12 amps	5 amps
12-gauge	20 amps	16 amps	7 amps

6. (**C**) Wood swells in high humidity and shrinks in low humidity. That movement is most extreme across the grain; in other words, the width changes more than the length. So gaps appear at the outside of a miter in high humidity. In low humidity, gaps develop at the inside. Wood movement is a powerful force. Glue, nails or screws usually can't stop it. In a room that will be subject to wide humidity swings, it's a good idea to finish the back of trim as well as the visible parts. A coat of paint or clear finish will limit humidity changes in the wood.

7. (**C**) The dishwasher hose should run up to the underside of the countertop to form a "high loop." That loop prevents sewage "backflow" from the disposal or sink. In some areas of the country, an "air gap" device is also required at the top of the loop.

8. False. The skinny bulbs will fit into the old fixture and light up. But they'll burn out fast. If you want to use T-8 bulbs in a T-12 fixture, you'll have to replace the ballast. But don't do that until you check prices. Depending on the situation, a new ballast ($15 or more) may cost as much as a new fixture.

9. (**C**) The National Electrical Code doesn't specify orientation of outlets, so both are correct. Ground up is most common in Canada; ground down is typical in the United States. Some experts argue that ground down is less safe: If a cord isn't plugged in tightly against the outlet, jewelry or a paper clip can fall onto the cord's hot and neutral prongs, creating a dangerous short circuit. Bottom line: Do it the way your electrical inspector prefers. (No matter what the question, the inspector is always right!)

10. (**A**) "Frost depth" is the maximum depth at which the ground is expected to freeze in your area. It ranges from a few inches in southern states to more than 4 ft. in the North. If footings or foundations don't go below frost depth, ice forming in the soil may lift the footing.

11. (**B** & **C**) Venting a bath fan into an attic is a risky shortcut, no matter how well the attic is ventilated. It will lead to moisture problems like wood rot, compacted insulation and water stains on ceilings. Also, insulated duct is required for bath fans. Without insulation, condensation will form inside the duct and leak down into the fan.

12. False. Adding water to grout that has begun to harden will make it easier to work with. BUT you should never do this. Extra water leads to more porous, weaker grout. Better to mix up a fresh batch. The same goes for other cement-based materials like concrete or mortar.

13. False. Asbestos was used in a huge variety of building materials before the 1970s and is a health hazard. But it's dangerous in the form of particles, not fumes. Breathing asbestos dust regularly can lead to lung diseases and cancer. If you suspect your home contains asbestos, buy a simple test kit at a home center or online. Most cost less than $20.

14. False. Today's acrylic latex paints are better than traditional oil paints in almost every way, especially outdoors where their elasticity allows them to flex as building materials shrink, swell and move due to weather changes.

15. (**B** or **C**). Some statistics show that most home injuries occur in the bathroom; others put stairs at the top of the list. Give yourself a point if you picked either.

WHAT'S YOUR LEVEL OF EXPERTISE?

Beginner: 0 – 5 correct
Intermediate: 6 – 12 correct
DIY Guru: 13 – 15 correct

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FROM OUR READERS greatgoofs@thefamilyhandyman.com

A BIT TOO CLOSE

Our new patio door looked great, but I wanted to add some security hardware. Easy enough, except that I drilled my first hole too close to the glass. When the drill bit hit the glass, the entire pane shattered into thousands of pieces. All I could do was to watch in horror as the fragments fell like rain. I thought I would have to replace the entire door assembly. Fortunately, the store where I bought the doors just happened to have a set of doors with no frame. The manager gave me a deal. I also purchased a different security lock!

Lloyd Lehn, Ph.D.

Cut the lights

When I built my house, I wanted a tall garage door opening to accommodate our full-size trucks. That meant I had to mount the garage door track just a few inches from the ceiling. The installation went without a hitch. The first time I hit the garage door button, the door opened perfectly, rolled smoothly along the rails—and sheared off my ceiling lights!

Ernie Smith

The demise of the power ties

My wife and I were looking for ways to upgrade our starter home, and one of my first projects was to cut a new doorway into the master closet. As I sawed through the drywall, I kept feeling resistance. But with a beginner's enthusiasm, I didn't let that deter me. Brute strength won out, the drywall came down, and I was left looking at the wreckage—I had cut through my entire rack of neckties hanging on the other side of the wall!

Rodney C. King

Got your own DIY mistake?
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See p. 2.

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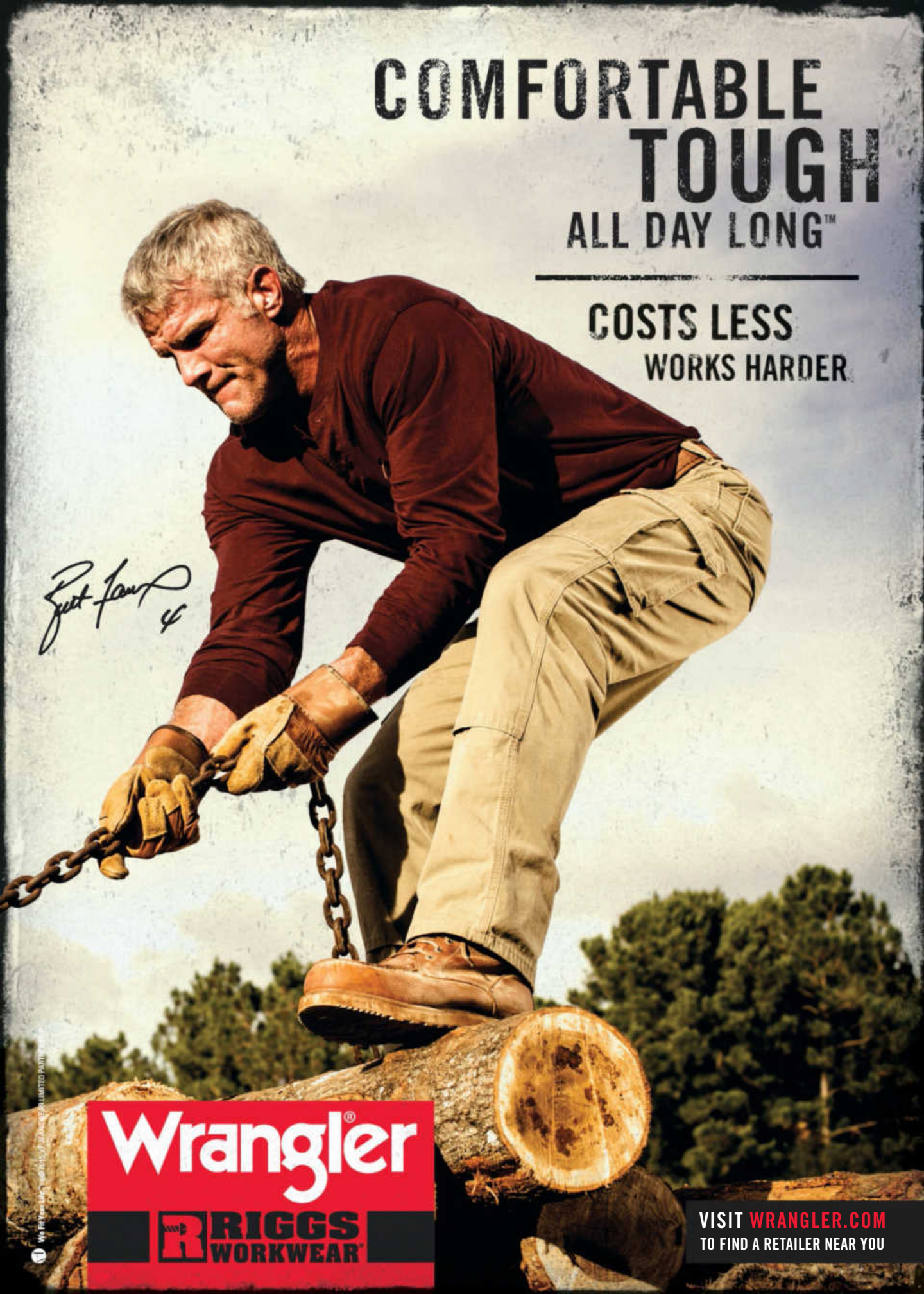
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